DOMINION OF CANADA
DEPARTMENT OF AGRICULTURE
DOMINION EXPERIMENTAL FARMS

EXPERIMENTAL STATION

SWIFT CURRENT, SASK.

REPORT OF THE SUPERINTENDENT

J. G. TAGGART, B.S.A.

FOR THE YEAR 1929

View of grounds showing five years' growth of trees and shrubs.

Published by Authority of the Hon. W. R. Motherwell, Minister of Agriculture,
Ottawa, 1930

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DOMINION EXPERIMENTAL STATION, SWIFT CURRENT, SASK.

REPORT OF THE SUPERINTENDENT, J. G. TAGGART, B.S.A.

NOTES ON THE SEASON

Following a severe winter, the spring season opened with fairly high temperatures during the latter half of April. Snow water was readily absorbed by the dry soil, thus helping to provide favourable conditions for germination.

With almost continuously fine weather, seeding proceeded so rapidly that practically all seed of both wheat and coarse grains was in the ground before the middle of May. From the time of emergence of the grain crops until near the end of June, both moisture and temperature conditions were sufficiently good to promote a satisfactory condition of all spring grain crops. Beginning in early July, temperatures were high, hot winds prevailed, and rainfall was scanty. These conditions forced the crops to an early maturity, resulting in comparatively low yields of light-weight grain. Harvesting began during the second week of August. All methods of harvesting common to the country were carried on almost without interruption through unfavourable weather. Harvesting costs were low. This, together with high quality and fair prices for wheat, partly offset the loss due to low yields.

Such feed crops as legumes and perennial grasses were more adversely affected by the drought conditions than the grain crops. However, since farmers still depend largely upon oats as a forage crop, the short crop of domestic hay was not a serious factor in the feed situation.

DATES OF FARM OPERATIONS, 1929

Operations	Began	Finished
Work on land (first and last dates)	April 20	Oct. 11
Seeding wheat	April 23	May 10
Seeding oats	May 9	May 13
Seeding corn	May 31	June 5
Seeding fall rye	Aug. 20	Aug. 23
Spring ploughing	April 22	May 6
Ploughing summer-fallow	May 21	June 11
Cutting hay	July 2	July 10
Cutting fall rye	July 29	Aug. 7
Cutting wheat	Aug. 12	Aug. 27
Cutting oats	Aug. 15	Aug. 20
Cutting corn	Sept. 4	Sept. 6
Operating combine	Aug. 7	Sept. 16
Threshing	Aug. 28	Sept. 16
Fall ploughing	Sept. 12	Oct. 1

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METEOROLOGICAL RECORD FOR SWIFT CURRENT, SASK., 1929

Month	Temperature			Precipitation 10 inches snow = 1 inch rain	Evaporation	Sunshine	Wind total miles
	High	Low	Mean				
	°F	°F	°F	in.	in.	hr.	
January	38	−47	−5·1	1·72	.....	69·8	.....
February	33	−41	2·6	0·22	.....	97·6	.....
March	65	−6	30·4	0·29	.....	152·5	.....
April	63	−6	35·0	0·64	.....	172·1	.....
May	88	8	45·5	1·81	4·74	262·4	6,893
June	83	32	58·6	2·59	6·94	255·5	6·328
July	98	39	66·1	1·30	9·27	347·3	5·577
August	101	35	64·9	0·44	8·26	250·5	5·123
September	79	25	48·7	1·33	3·68	155·2	4·331
October	81	18	44·2	0·29	2·74	182·9	4·892
November	59	−17	25·5	0·62	.....	84·0	.....
December	46	−35	9·7	1·19	.....	69·6	.....
Totals	.....	.....	.....	12·44	35·63	2,099·4	33,144

Last spring frost.....May 18.
First fall frost.....September 3
Frost-free period.....107 days.
Rainfall during April, May, June, July.....6·34 inches.

ANIMAL HUSBANDRY

No changes of any consequence have been made in the Animal Husbandry work on this Station. Some improvements in breeding herds have been effected through the addition of better sires and more closely selecting the females.

HORSES

While the field work has expanded considerably in recent years the number of work horses remains at sixteen. The increased volume of work has been handled by increased use of the tractor. In the general field work the horses are used chiefly to pull drills, disks, cultivators and binders, while the heavier jobs such as ploughing and pulling the combine as well as some of the disking and cultivating are handled by the tractor.

This distribution of work as between horses and tractor is economical and satisfactory for the conditions surrounding the work of the Station. On farms in the vicinity of the Station on which the variety of work is limited and the volume large, tractors are gaining in favour.

CATTLE

During the year all cattle have been tested by the Health of Animals Branch, under Accredited Herd Regulations, for bovine tuberculosis and no infected animals have been found.

Through the co-operation of the same Branch all cattle have been subjected to blood tests for the presence of the specific germ of contagious abortion. Several animals which were either positively infected or doubtful were disposed of for slaughter.

HOLSTEINS

The Holstein herd has not been increased in numbers, but during the year several sales have been made from this herd. These include two animals for slaughter and six for breeding purposes. The following table indicates the cost of feed and the return value of milk produced. No allowances are made in the table for expenses other than feed and pasture.

DAIRY CATTLE—PRODUCTION AND FEED RECORD

Cow	Age at beginning of period	Number of lactation period	Days in milk	Milk produced	Cost of feed and pasture	Value milk of	Profit feed over
				lb.	$	$	$
*Biddy "E" (grade)	5 years	4th	250	9,362·0	80 43	140 43	60 00
Lyons Segis Butter Girl (68058)	9 years	6th	101	5,403·3	42 91	81 05	38 14
*Korndyke Francy May (115102)	5 years	4th	189	6,821·7	70 27	102 32	32 05
Korndyke Francy Bos. (132258)	4 years	3rd	249	6,925·8	74 91	103 88	28 97
*Swift Current Biddy "B" (grade)	2 years	1st	158	4,761·3	50 72	71 42	20 70
Swift Current Butter Girl (178931)	2 years	1st	282	6,813·8	99 96	102 20	2 24
Average			205	6,681·3	69 87	100 22	30 35

*Lactation period not completed.

SHORTHORNS

As a result of sales both for slaughter and for breeding purposes the shorthorn herd has declined in numbers. However, the females which now remain in the herd are young and reasonably good individuals.

Sales from the Shorthorn herd are as follows: For slaughter, four; for breeding purposes, two.

SWINE

The breeding herd of Yorkshire swine has been increased by the retention of two excellent young sows for breeding. These, together with the two mature sows have been entered for advanced registry. Four young boars were sold for breeding purposes. Twenty-nine hogs were sold for pork.

The swine on hand at present consist of one boar, five sows and eighteen young pigs. Of the latter, ten are being used for the advanced registry work. The balance will be sold for breeding purposes or for pork depending upon the suitability of the individuals and the demand for breeding stock.

Some improvements in the facilities for handling the swine have been made by fencing in four pasture lots of alfalfa, the construction of two portable cabins and permanently fencing the exercise lots adjacent to the hog house.

FIELD HUSBANDRY

SEVEN-YEAR ROTATION—CORN, WHEAT (GRASS-SEEDED), HAY, HAY AND FALLOW, WHEAT, FALLOW AND FALL RYE

Summary of yields, value and profit and loss per acre

Crop	Yield per acre		Value	Cost of Production	Profit and loss	
	1929	Average 7 years			1929	Average 7 years
	bush. or tons	bush. or tons	$	$	$	$
Corn	0·6	3·2	2 80	11 48	−8 68	−0 18
Wheat (grass seeded)	11·1	22·7	14 43	10 05	4 38	14 01
Hay	.....	1·0	.....	7 27	−7 27	1 69
Hay and fallow	0 7	0·7	3 65	4 49	−0 84	1 89
Wheat	5·5	21·2	7 15	13 22	−6 07	8 78
Fallow	.....	.....	.....	.....	.....	.....
Fall rye	17·4	23·9	16 57	15 50	1 07	2 59
Totals for rotation	.....	.....	44 60	62 01	−17 41	28 79
Average per acre	.....	.....	6 37	8 86	−2 49	4 11

The corn in this rotation again produced a poor crop due on this occasion to wireworm damage to the seed. The plants which emerged made a fair growth and had the wireworm damage been less severe a fair crop would have been harvested. Over the seven-year period the corn crop has shown a loss of 18 cents per acre.

Yields of wheat following corn have been fairly good, the average yield being 22·6 bushels. This field shows much the highest average profit of any field in the rotation.

The 1928 seeding of hay failed and was reseeded to sweet clover in order to provide a hay crop for next year. The second hay crop was poor and showed a loss of 74 cents per acre. The frequent failure of both corn and hay have reduced the profit from this rotation as compared with a straight grain rotation.

THREE-YEAR ROTATION—FALLOW, WHEAT, WHEAT

Summary of yields, value and profit and loss per acre

Crop	Yield per acre		Value	Cost of production	Profit or loss	
	1929	Average 6 years			1929	Average 6 years
	bush.	bush.	$	$	$	$
Fallow						
Wheat	11·2	25·4	14 63	13 58	1 05	13 29
Wheat	6·9	15·9	8·45	11 35	−2 90	6 00
Total for rotation			25 08	24 93	−1 85	18 13
Average per acre			7 69	8 31	−0 62	6 32

For the first time since this rotation was started the second wheat crop showed a loss and the yield even on fallow was so low as to show only a small margin over cost. Over the whole period of trial this rotation has been the most profitable on the Station. The land on which all of the rotations are located is reasonably free from weeds and insect pests. If these factors were more adverse the standing of the rotation might be different.

TWO-YEAR ROTATION—FALLOW, WHEAT

Summary of yields, value and profit and loss per acre

Crop	Yield per acre		Value	Cost of production	Profit or loss	
	1929	Average 7 years			1929	Average 7 years
	bush.	bush.	$	$	$	$
Fallow						
Wheat	10·8	20·6	14 04	16 32	−2 28	8 31
Totals for rotation			14 04	16 32	−2 28	8 31
Average per acre			7 02	8 16	1 14	4 15

Due to a small yield this rotation also showed a loss in 1929. Over the seven-year period the alternate fallow and wheat method has been less profitable than two crops of wheat and a fallow.

TWO-YEAR ROTATION—FALLOW, FALL RYE

Summary of yields, value and profit and loss per acre

Crop	Yield per acre		Value	Cost of production	Profit or loss	
	1929	Average 7 years			1929	Average 7 years
	bush.	bush.	$	$	$	$
Fallow						
Fall rye	15·0	22·4	14 25	15 89	−1 64	0 63
Totals for rotation			14 25	15 89	−1 64	0 63
Average per acre			7 12	7 94	−0 82	0 31

The yield of rye on fallow was much better than the wheat yield in a comparable rotation. In spite of the fairly good yield the rotation still showed a loss this year and over the whole period of seven years the gain is very small. Rye cannot be economically grown under this rotation plan.

SOIL PACKERS

As indicated in last year's report the relative positions of the two packers in the field have been changed so as to overcome the effects of possible soil variations. The yields this year in relation to the packers were opposite to those of former years, indicating that in this experiment differences have been due to soil rather than packer.

In the plot experiment in which 13 plots were alternately packed and not packed, the packed plots showed earlier emergence and slightly more advanced growth all season. The yields from these plots are shown below.

YIELDS ON PACKED AND UNPACKED LAND

Field No.	Crop	Treatment	Yield per acre	
			1929	Average 7 years
			bush.	bush.
1	Wheat	Fallow cultipacked, seeded and packed	13·5	27·7
2	Wheat	Standard fallow, no packing, seeded	15·1	26·7
3	Wheat	Fallow surface packed, seeded, packed	14·2	25·7
1	Wheat	Spring ploughed, cultipacked, seeded, packed	7·7	19·9
2	Wheat	Spring ploughed, no packing, seeded, harrowed	9·0	18·4
3	Wheat	Spring ploughed, surface packed, seeded, packed	9·2	18·9

PACKER EXPERIMENT ON MARQUIS WHEAT—1/50-acre plots—Replicated 5 times

—	Height at harvest	Yield per acre	Weight per measured bushel
	in.	bush.	lb.
Sown on fallow—cultipacked	36	18·2	56·0
Sown on fallow—not packed	35	16·6	56·0
Sown on stubble land—cultipacked	20	5·9	57·0
Sown on stubble land—not packed	20	5·7	57·0

SUMMER-FALLOW

Results from various Summer-fallow Treatments

Field	Crop	Treatment	Yield per acre	
			1929	Average 6 years
			bush.	bush.
1	Wheat	Fall ploughed, cultivated during fallow year	7·0	20·3
2	Wheat	Fall disked, cultivated during fallow year	11·0	23·9
3	Wheat	Cultivated only during fallow year	12·5	24·1
4	Wheat	Cultivated till July 15, ploughed	13·0	23·8
5	Wheat	Ploughed 6 inches deep June 15, cultivated	11·5	23·7
6	Wheat	Ploughed before June 15, cultivated	12·5	22·9

Summer-fallow Treatments for Wheat Production

1/50-acre Plots—triplicated

	Treatment	Yield per acre	
		1929	Average 5 years
		bush.	bush.
1	Fall ploughed, cultivated in fallow year	9·6	26·0
2	Fall disked, cultivated in fallow year	8·0	25·4
3	Cultivated as required to July 15, ploughed and left untilled	8·8	25·2
4	Ploughed June 10, 6 inches, cultivated in fallow year	9·5	25·3
5	Cultivated only during fallow year	9·7	25·5
6	Ploughed June 10, 6 inches, 5 pounds S. clover per acre sown with 2nd year wheat	9·3	25·2
7	Spring burned, disked, ploughed June 10, cultivated as required	9·6	25·8
8	Disked early, ploughed June 10, cultivated as required	10·9	25·7
9	Ploughed June 10, 4 inches, cultivated as required	10·0	26·2
10	Ploughed June 10, 8 inches, cultivated as required	8·7	25·6
11	Ploughed June 10, 6 inches subsoiled 4 inches, cultivated as required	9·9	24·9
12	Ploughed May 15, cultivated as required	8·5	25·1
13	Cultivated only both falllow and stubble crops	10·8	23·7

Neither in fields nor in plots can any material difference be discovered in the yields of wheat after various fallow treatments, with the possible exception that, in the fields, the fall-ploughed fallow has averaged about four bushels per acre less than the other treatments. That this same difference is not apparent in the plots is probably due to the fact that small plots are less exposed to the wind during the first winter than is the case with the same treatment under field conditions.

It would seem in general that the method of summer-fallowing which is cheapest and at the same time most effective in the control of weeds and soil drifting is the best method. Just which method is to be followed should be determined by the type of weeds present and by the risk of soil drifting. On fine sandy loam and clay loam soils with annual weeds only, the ploughless fallow is usually satisfactory. If soil drifting is feared, fairly late ploughing preceded by sufficient cultivation to control weeds may be satisfactory. On these soils deeper ploughing is at least temporarily effective against drifting. On the other hand deep ploughing and resultant loose condition of the fallow land is more conducive to heavy wire worm damage in case the land is infested with these insects.

On heavy clay soils surface working with cultivator disk and rod weeder seems to be fully as effective for both weed and soil drifting control as is ploughing. Since ploughing clay land is a costly operation, many farmers on such land

do not regularly plough their summer-fallows. On very sandy soils ploughing is essential as at least a partial control of soil drifting. Late ploughing with little or no subsequent work is most effective in the prevention of drifting on sandy coils.

STUBBLE TREATMENTS

Results from Various Stubble Treatments

Field	Crop	Treatment	Yield per acre	
			1929	Average 7 years
			bush.	bush.
1	Wheat	Fall ploughed, harrowed, seeded, harrowed	8·8	17·7
2	Wheat	Fall disked, spring ploughed, harrowed, seeded, harrowed	9·2	19·6
3	Wheat	Spring ploughed, harrowed, seeded, harrowed (previous crop cut with combine)	7·2	19·8
4	Wheat	Spring burned, seeded (previous crop cut with combine	10·7	18·9
5	Wheat	Spring burned, disked, seeded	11·7	20·3
6	Wheat	Spring burned, disked, seeded, harrowed	9·5	19·0
7	Wheat	Spring burned, ploughed, harrowed, seeded, harrowed	8·7	20·6
8	Wheat	Spring disked, seeded, harrowed	4·7	16·4

Note.—The fallow crop in this experiment averaged 16·7 bushels per acre in 1929. Average for seven years is 32·6 bushels per acre.

Stubble Treatments for Wheat Production

1/50-acre plots triplicated

No.	Plot treatment	Yield per acre	
		1929	Average 6 years
		bush.	bush.
1	Fall ploughed, spring harrowed, sown	2·4	18·7
2	Fall disked, spring ploughed, harrowed, sown	3·3	18·9
3	Spring ploughed 4 inches, harrowed, sown	4·5	19·8
4	Spring burned, disked, harrowed, sown	4·6	20·2
5	Spring burned, spring ploughed, harrowed, sown	4·2	18·7
6	Spring disked, harrowed, sown	4·0	18·4
7	Spring burned, sown	3·3	18·5
8	Sown in stubble	4·7	13·4
9	Spring burned, poughed 7 inches, harrowed, sown	5·5	20·2
10	Spring burned, ploughed 4 inches, subsoiled 6 inches, harrowed, sown	4·7	20·9
11	Fall burned, spring ploughed 4 inches, harrowed, sown	3·7	20·6
12	Fall burned, spring disked, harrowed, sown	3·7	21·6
13	Spring burned, cultivated, harrowed, sown	3·2	19·6

Yields of wheat from all methods of preparing stubble land were so low in 1929 that it is difficult to attach any great significance to this year's results. Practices, such as seeding without any preparatory work, which, on the average, produce very low yields, this year gave as good yields as other methods involving much more work. All plots were reasonably free of weeds. All suffered from the effects of dry weather but on the whole fall-worked plots suffered more damage from this cause than those which were worked in the spring only.

On the larger field areas yields were better than on the plots. The only treatments which fell materially below the general average were fall ploughing and spring disking. These treatments showed a greater infestation of weeds and being on the outsides of the field suffered slightly more damage from sawfly. The burning of the combine stubble reduced the weed infestation to some extent.

Commercial Fertilizers for Wheat

Applied with combination fertilizer and seed drill

Kind of fertilizer and rate of application per acre	Yield per acre, 1929, average of duplicate test			
	Wheat on fallow		Wheat on stubble	
	Yield	Weight per measured bushel	Yield	Weight per measured bushel
	bush.	lb.	bush.	lb.
Superphosphate applied on fallow only—				
No fertilizer (check)	14·37	58·0	.....	.....
50 pounds per acre	14·89	55·5	.....	.....
100 pounds per acre	15·42	55·0	.....	.....
No fertilizer (check)	15·10	56·0	.....	.....
Superphosphate applied on Stubble only—				
No fertilizer (check)	.....	.....	5·41	57·0
50 pounds per acre	.....	.....	3·54	59·0
100 pounds per acre	.....	.....	3·23	59·0
No fertilizer (check)	.....	.....	4·48	57·5
Superphosphate applied on both Fallow and Stubble—				
No fertilizer (check)	14·89	56·0	6·56	56·5
50 pounds per acre	15·20	55·5	11·04	57·0
100 pounds per acre	16·54	55·0	13·43	56·0
No fertilizer (check)	15·42	56·0	14·06	58·0
Ammonium Sulphate applied on Fallow—				
No fertilizer (check)	14·37	57·0	.....	.....
50 pounds per acre	15·10	55·0	.....	.....
100 pounds per acre	13·85	54·0	.....	.....
No fertilizer (check)	14·16	56·0	.....	.....
Ammonium Sulphate applied on Stubble—				
No fertilizer (check)	.....	.....	3·64	55·0
50 pounds per acre	.....	.....	3·85	57·5
100 pounds per acre	.....	.....	4·90	57·0
No fertilizer (check)	.....	.....	4·58	55·5
Ammonium Sulphate applied on both Fallow and Stubble—				
No fertilizer (check)	12·80	56·5	5·00	56·0
50 pounds per acre	13·96	56·5	5·93	56·5
100 pounds per acre	12·91	55·5	6·04	57·0
No fertilizer (check)	16·32	57·5	5·73	56·5
Muriate of Potash applied on Fallow—				
No fertilizer (check)	16·55	57·5	.....	.....
25 pounds per acre	17·08	56·5	.....	.....
50 pounds per acre	16·45	57·0	.....	.....
No fertilizer (check)	16·14	56·5	.....	.....
Muriate of Potash applied on Stubble—				
No fertilizer (check)	.....	.....	3·33	54·5
25 pounds per acre	.....	.....	5·21	55·0
50 pounds per acre	.....	.....	2·70	56·5
No fertilizer (check)	.....	.....	2·29	56·5
Muriate of Potash applied on both Fallow and Stubble—				
No fertilizer (check)	14·89	55·5	3·12	57·0
25 pounds per acre	15·51	56·5	4·69	55·5
50 pounds per acre	15·62	57·0	4·68	55·5
No fertilizer (check)	14·79	57·5	3·44	54·5
Combined Fertilizer applied on Fallow—				
No fertilizer (check)	15·72	57·5	.....	.....
50 pounds phosphate; 50 pounds amm. sulphate; 25 pounds potash	14 68	55·5	.....	.....
100 pounds phosphate; 100 pounds amm. sulphate; 50 pounds potash	13·33	53·5	.....	.....
No fertilizer (check)	13·64	56·0	.....	.....

COMMERCIAL FERTILIZERS FOR WHEAT—*Concluded*

Applied with combination fertilizer and seed drill

Kind of fertilizer and rate of application per acre	Yield per acre, 1929, average of duplicate test			
	Wheat on fallow		Wheat on stubble	
	Yield	Weight per measured bushel	Yield	Weight per measured bushel
	bush.	lb.	bush.	lb.
Combined Fertilizer applied on Stubble—				
No fertilizer (check)	.....	.....	3·96	56·0
50 pounds phosphate; 50 pounds amm. sulphate; 25 pounds potash	.....	.....	4·16	58·0
100 pounds phosphate; 100 pounds amm. sulphate; 50 pounds potash	.....	.....	1·98	57·0
No fertilizer (check)	.....	.....	2·92	55·5
Combined Fertilizer applied on both Fallow and Stubble—				
No fertilizer (check)	12·71	56·5	4·37	56·5
50 pounds phosphate; 50 pounds amm. sulphate; 25 pounds potash	12·91	55·0	8·54	56·0
100 pounds phosphate; 100 pounds amm. sulphate; 50 pounds potash	14·68	54·5	6·46	55·5
No fertilizer (check)	13·33	56·0	7·50	56·0

This year for the first time the fertilizer plots were seeded with a combination seed and fertilizer drill. By this means the fertilizer was placed at the same depth in the soil as the wheat.

While previously it had been impossible to see any effect from any fertilizer, this year a marked stimulation of stooling and early growth could be observed on the plots which had received phosphate fertilizer. The effect of the nitrogen fertilizer, while it could be observed, was much less apparent than was the case with phosphate. A study of the yields does not indicate any difference in final outcome as between fertilized and unfertilized plots. The only reason that can be suggested as to why the extra growth on the fertilized plots was not reflected in extra yields is that the moisture supply in the latter part of the season was not sufficient to " fill " even the lighter growth on the unfertilized plots, hence the extra growth stimulated by the fertilizer was of no value this year.

On nearby soil of the same type, but containing a heavy infestation of wireworms and weeds, superphosphate produced material improvement in both appearance and yield of wheat on fallow. On a heavy clay soil on which a normal stand was obtained without fertilizer, the superphosphate produced a thirty per cent increase in yield. On a very light sandy soil, the superphosphate appeared to depress the wheat yield. These experiments, though covering only a short period of time indicate that there are conditions in Southwestern Saskatchewan under which material increases in yield may be expected to follow the application of superphosphate. They also indicate that even within short distances there may be conditions under which no increased yield would be secured from such application.

SUMMER-FALLOW SUBSTITUTES

In the 1928 report a complete statement was published showing the yields of fallow substitutes and the yields of succeeding wheat from the beginning of the experiment until the end of 1928. The summary presented herewith includes

the yields of wheat for 1929 following the substitutes grown in 1928. The averages for substitutes therefore are for the years 1922 to 1928 inclusive, while the averages for wheat following substitutes are for the years 1923 to 1929 inclusive. This arrangement of the data is necessary in order to permit observations on the effect of the substitute on succeeding wheat crops.

RESULTS FROM VARIOUS SUMMER-FALLOW SUBSTITUTES

1/50 acre plots triplicated

	Fallow substitute	Yield per acre					
		1929			Eight-year average		
		Grain	Fodder, green weight	Fodder, dry weight	Grain	Fodder, green weight	Fodder, dry weight
		bush.	tons	tons	bush.	tons	tons
1	Potatoes—rows 42 inches by 18 inches	19·2	.....	.....	131·2	.....	.....
2	Millet—double rows	.....	Failed	Failed	.....	.....	.....
3	Sunflowers—hills 42 inches by 42 inches	.....	3·70	0·52	.....	10·22	1·84
4	Corn—hills 42 inches by 42 inches	.....	1·15	0·25	.....	5·91	1·10
5	Oats—triple rows	Failed	.....	.....	42·3	.....	.....
6	Oats—double rows	Failed	.....	.....	36·4	.....	.....
7	Oats—sown one half bushel per acre	Failed	.....	.....	36·5	.....	.....
8	Wheat—double rows	Failed	.....	.....	8·9	.....	.....
9	Oats—sown 2 bushels per acre June 6 for green feed	.....	Failed	Failed	.....	3·60	1·93
10	Barley—double rows	Failed	.....	.....	21·4	.....	.....

SUMMER-FALLOW SUBSTITUTES AND SUCCEEDING WHEAT CROPS

1/50-acre plots triplicated

Fallow or fallow substitute	Seven-year average		
	Yield of fallow substitute		Yield of succeeding wheat crop
	Green weight	Dry weight	
	tons	tons	bush.
Sudan grass, double rows	.....	.....	18·1
Sunflowers	11·1	2·0	17·3
Fallow	.....	.....	26·6
Corn	6·59	1·22	22·2
Oats sown late for green feed	4·12	1·18	12·9
		bushels	
Potatoes	.....	147·2	22·1
Oats triple rows	.....	48·4	16·0
Oats, double rows	.....	41·6	13·7
Oats sown ½ bushel per acre	.....	41·7	12·7
Wheat double rows	.....	10·2	17·5
Barley double rows	.....	24·5	17·9

An examination of the detailed data in the 1928 report will indicate that in several years some of the substitutes, notably corn, produced very low yields. These low yields were generally reflected in an increased yield of wheat in the following year.

The crops which in ordinary practice are grown in rows; namely, corn, potatoes and sunflowers, have proven to be the best fallow substitutes. Probably the chief reason for this is that weeds have been more easily kept under control

in these crops than in small grain crops in rows. With wheat, oats and barley in rows it has been found impossible to keep the rows reasonably free of weeds without hand hoeing. Since hand work of this sort is out of the question on crops of such low value, the failure to control weeds constitutes the greatest objection to small grain crops in rows as fallow substitutes. Moreover, wheat

Oats and barley in rows as fallow substitutes, showing weeds in rows.

following small grains in rows has not produced any higher yield than wheat after wheat in a three-year rotation. When the production of wheat in rows is added to the following wheat crop the total so obtained is less than the total production of wheat in the three-year rotation. This aspect of the fallow substitute question is dealt with in the next paragraph of this report.

WHEAT IN DIFFERENT ROTATIONS

The three-year rotation of fallow, wheat, wheat, continues to give the highest average yield per acre over the whole area of the rotation. Likewise the net returns are higher than from either continuous wheat or alternate wheat and fallow. Under conditions which produce poor crops of wheat on stubble it may be advisable to fallow half the land, but if the stubble crop is equal to seventy per cent of the fallow then the three-year system is usually preferable.

YIELDS OF WHEAT IN DIFFERENT ROTATIONS

Rotation	Part of area in crop	Five-year average yield per acre	
		Cropped area	Total area of rotation
		bush.	bush.
Continuous wheat on spring ploughing	All	10·2	10·2
Two-year—fallow substitute of wheat in rows; wheat	All	12·9	12·9
Two-year—fallow; wheat	Half	26·1	13·0
Three-year—fallow; wheat; wheat	Two-thirds.	23·1	15·4

CORN AND SUNFLOWERS PLANTED IN HILLS AND ROWS

With both varieties of corn and the sunflowers the thick planting produces the highest yields of both green and dry material. Particularly with sunflowers, the wide spacing in the row produces large individual plants which are difficult to cut and handle.

The hill planting of corn has produced lower yields than the rows, but the hills are more easily kept free of weeds.

YIELDS OF FODDER CORN AND SUNFLOWERS PLANTED IN HILLS AND ROWS

Variety	Method	Spacing of plants per hill	1929 Yield		Five-year average	
			Green weight	Dry weight	Green weight	Dry weight
		in.	tons	tons	tons	tons
Fodder corn—						
Minnesota No. 13	Rows 42 inches apart	6	2·83	0·72	8·08	1·56
		12	3·86	0·99	7·56	1·60
		18	3·90	0·80	7·23	1·26
		plants				
	Hill 42 inches by 42 inches	2	1·61	0·31	7·73	1·15
		4	1·08	0·23	6·22	1·27
		in.				
Gehu	Rows 42 inches apart	6	1·77	0·46	7·48	1·59
		12	2·37	0·60	7·20	1·34
		18	2·74	0·72	6·88	1·22
		plants				
	Hill 42 inches by 42 inches	2	2·47	0·72	5·67	1·26
		4	2·80	0·60	6·82	1·42
		in.			Six-year	average
Sunflowers—						
Russian Giant	Rows 42 inches apart	6	3·51	0·88	9·31	2·10
		12	4·61	1·10	8·48	1·75
		18	2·36	0·57	7·30	1·56

FALL RYE

Rates of seeding fall rye on fallow ranging from three pecks to 6 pecks, when seeded on the same date, have produced about the same average yield. The most favourable time for seeding is indicated as falling within the last week of August and the first week of September. Very late and very early seeding produce materially lower yields than seeding within the time indicated above.

RESULTS FROM VARIOUS RATES AND DATES OF SEEDING FALL RYE

1/50-acre plots triplicated

——	Rate bushels per acre	Date sown	Date of ripening	Height at harvest	Yield of grain per acre 1929	Average for six years
				in.	bush.	bush.
1	¾	July 15	July 29	39	10·8	20·5
2	1	" 15	" 29	31	6·5	19·4
3	1¼	" 15	" 29	32	6·8	16·4
4	1½	" 15	" 29	32	6·7	20·9
5	1	Aug. 1	" 29	32	8·0	26·1
6	¾	" 15	" 29	31	8·3	27·0
7	1	" 15	" 29	35	7·6	29·2
8	1¼	" 15	" 29	35	7·7	29·1
9	1½	" 15	" 29	35	10·0	29·5
10	¾	Sept. 1	" 29	35	6·8	30·0
11	1	" 1	" 29	39	9·4	30·9
12	1¼	" 1	" 29	29	3·7	29·1
13	1½	" 1	" 29	30	3·9	30·5
14	1	" 15	" 29	36	5·2	26·3
15	1	Oct. 1	" 29	31	4·0	22·5

PLACE IN ROTATION TO SEED FALL RYE

1/50-acre plots triplicated

Preceding crop or treatment	Yield per acre	
	1929	Six-year average
	bush.	bush.
1 Seed on fallow	14·0	29·3
2 Seed on ploughed barley stubble	4·2	16·7
3 Seed on ploughed sod	3·6	16·5
4 Seed on wheat stubble	10·0	16·2
5 Seed on fallow	10·3	28·9
6 Seed with oats	Failed	11·5
7 Seed on disked sunflower stubble	Failed	13·5
8 Seed rye after rye	Failed	13·0
9 Seed on fallow	12·6	28·5
10 Seed on disked corn stubble	7·1	19·3
11 Seed one month after oats sown	4·0	15·3
12 Seed between rows of corn	8·0	20·5
13 Seed between rows of sunflowers	5·4	17·8

In this experiment three failures of the rye crop were noted in the 1929 crop. The methods which failed this season have produced the lowest average yields over the six-year period. It is also of interest to observe that apart from seeding on fallow the rye on wheat stubble, which involved no preparatory work, produced the highest yield this year and this same procedure is among the best in the six-year average.

DATES OF PLANTING CORN AND SUNFLOWERS

In dates of planting tests with corn, plantings between May 10 and May 20 have given the best yields and most advanced stage of maturity. For maximum yields, sunflowers should be planted as early in May as possible. Sunflowers are more frost resistant than corn and they also seem to make considerable growth at low temperatures in the early spring, hence the wisdom of early planting.

RESULTS FROM DIFFERENT DATES OF PLANTING CORN AND SUNFLOWERS

Date planted	Date first plants emerged	Yield per acre			
		1929		Six-year average	
		Green weight	Dry weight	Green weight	Dry weight
		tons	tons	tons	tons
Minnesota No. 13 Corn—					
May 1	May 31	3·76	0·77	5·73	1·09
" 10	June 4	3·35	0·72	6·92	1·41
" 20	" 7	3·17	0·68	6·59	1·34
" 30	" 8	2·39	0·50	6·25	1·07
June 9	" 17	2·13	0·53	6·39	0·90
Improved Squaw—					
May 1	May 30	1·21	0·32	.....	.....
" 10	June 3	0·94	0·25	.....	.....
" 20	" 6	1·01	0·27	.....	.....
" 30	" 8	1·40	0·32	.....	.....
June 9	" 18	1·20	0·25	.....	.....
Russian Giant Sunflowers—				Seven-ye	ar average
May 1	May 29	2·62	0·64	12·31	2·35
" 20	June 5	4·61	1·10	10·65	1·96
June 9	" 17	1·91	0·37	6·33	1·11

DATES OF SEEDING GRASSES AND LEGUMES

In this experiment grasses and clovers are seeded alone on the dates shown in the table. The yields given are for the year following the year of seeding. It would appear from the five-year record that grasses and clovers may be seeded as late as July 1 without serious risk of losing the stand or having the yield reduced. In fact seedings between May 30 and July 1 have given better average yields than earlier seedings. The earlier seedings are usually more heavily infested with weeds, although in an unusually favourable season the very early seedings may produce a sufficient stand to permit of cutting for hay in the year of seeding.

RESULTS FROM DIFFERENT DATES OF SEEDING GRASSES AND LEGUMES

Date seeded	Yield per acre			
	1929		Five-year average	
	Brome, western rye, alfalfa	Sweet clover	Brome, western rye, alfalfa	Sweet clover
	tons	tons	tons	tons
May 1	0·63	0·74	0·88	1·31
" 15	0·44	0·74	0·79	1·17
" 30	0·49	0·60	0·84	1·59
June 15	0·38	0·55	1·23	1·61
July 1	0·39	0·85	1·64	1·50
Oct. 1	Failed	Failed	*	*
" 15	†	Failed	†	*

* In test three years and failed each year.
† Not in test.

PREPARATION OF LAND FOR HAY

This experiment is intended to disclose whether there is any material difference in yield of hay following different methods of land preparation prior to seeding grasses and clovers. All plots were seeded alone, no nurse crop being used. So far the grasses and clovers seem to do about equally well on the various preparations.

RESULTS FROM DIFFERENT METHODS OF PREPARATION OF LAND FOR HAY

1/100-acre plots triplicated

Plot treatment	Yield per acre			
	1929		Two-year average	
	Brome, western rye, alfalfa	Sweet clover	Brome, western rye, alfalfa	Sweet clover
	tons	tons	tons	tons
Fall plough, spring harrow, cultivate till seeding, harrow	0·26	0·63	0·80	1·28
Fall plough, spring harrow, cultivate till seeding, harrow, pack, seed, pack	0·35	0·65	0·71	1·37
Spring plough early, harrow, cultivate till seeding, harrow, seed, harrow	0·33	0·70	0·71	1·46
Spring plough, early harrow, cultivate till seeding, harrow, pack, seed, pack	0·32	0·62	0·68	1·26
Plough about June 1, harrow, seed, harrow	0·31	0·74	0·66	1·41

PLACE IN ROTATION TO SEED GRASSES AND CLOVERS

Grasses and clovers sown alone on fallow or spring ploughing have the greatest chance of survival, but this method of seeding is not usually economically sound. If grasses are to be grown as a part of the rotation plan they must usually be seeded with a grain crop and the owner must take the risk of losing a stand when conditions are unfavourable. For seeding down permanently a small acreage, where it is desirable to be sure of getting a stand, seeding alone is justified.

PLACE IN ROTATION TO SEED GRASSES AND CLOVERS

1/50-acre plots

	Crop	Weeds	Yield per acre cured hay 12 per cent moisture	
			1929	Seven-year average
			tons	tons
1	Brome and western rye sown with first year wheat	Bad	Failed	1·47
2	Brome and western rye sown between rows of corn	Bad	Failed	1·11
3	Brome and western rye sown alone on fallow	Bad	0·93	2·09
4	Brome and western rye sown alone on spring ploughing	Bad	0·45	1·66
5	Brome and western rye down with first year wheat	Bad	Failed	1·47
6	Brome and western rye sown in spring on fall rye	Volunteer rye.	0·90*	.....
7	Brome and western rye sown with second year wheat	Many	Failed	0·90
8	White sweet clover sown with first year wheat	Many	Failed	1·97
9	Brome and western rye sown with first year wheat	Many	Failed	1·41
10	White sweet clover sown between rows of corn	Many	Failed	1·51
11	White sweet clover sown alone on fallow	Nil	1·53	1·81
12	White sweet clover sown alone on spring ploughing	Nil	0·81	1·74†
13	Brome and western rye sown with first year wheat	Many	Failed	1·26
14	White sweet clover sown in spring on fall rye	Volunteer rye.	1·18*	.....
15	White sweet clover sown with second year wheat	Bad	Failed	1·37
16	Brome and western rye sown with first year wheat	Bad	Failed	1·33

* Volunteer stand of fall rye, weedy, no grass or clover.
† Six year average,

ROTATIONS

SEVEN-YEAR ROTATION—OLD WEEDY LAND

Summary of yields, value and profit and loss per acre

Crop	Yield per acre		Value	Cost of production	Profit or loss	
	1929	Average 5 years			1929	Average 5 years
	bush. or tons	bush. or tons	$	$	$	$
Corn	0·8	0·8	3 75	13 05	−9 30	−7 71
Wheat (grass seeded)	5·8	17·3	7 48	8 70	1 22	9 67
Hay	0·8	0·7	3 77	5 53	−1 76	1 58
Hay and fallow	0·8	0·8	3 77	4 10	−0 33	1 69
Wheat	3 5	20·9	4 55	12 92	−8 73	2 21
Fallow	.....	.....	.....	.....	.....	.....
Fall rye	6·1	17·3	5 82	13 01	−8 19	0 23
Totals for rotation	.....	.....	29 14	57 31	−27 09	7 98
Average per acre	.....	.....	4 16	8 19	−3 88	1 13

Although the wheat yield this year after hay sod ploughed in the preceding July was poor, wheat yields in general have been better in this rotation than in a three-year rotation of fallow, wheat, wheat on adjoining land. On wireworm

and weed infested land the growth of rye is not only fairly good in itself, but conditions seem to be improved thereby for wheat crops which come later in the rotation.

The hay crop has usually been thin and weedy and wheat following hay has fluctuated widely in yield. Wheat after corn has produced a fair average yield, but due to severe wireworm damage to the corn the corn field has more closely resembled summer-fallow than a corn crop.

THREE-YEAR ROTATION—FALLOW, FALL RYE, FALL RYE, OLD WEEDY LAND

Summary of yields, value and profit and loss per acre

Crop	Yield per acre		Value	Cost of production	Profit or loss	
	1929	Average 4 years			1929	Average 4 years
	bush.	bush.	$	$	$	$
Fallow						
Fall rye	11·8	22·9	15 28	12 85	2 43	4 76
Fall rye	8·5	12·4	11 05	10 29	0 76	−0 18
Totals for rotation			26 33	23 14	3 19	4 59
Average per acre			8 78	7 71	1 07	1 53

On this wireworm and weed infested land rye has shown somewhat higher average yields than wheat, but due to the low return value of the rye the rotation has not been very profitable. However, as a means of reducing weed infestation and wireworm damage the use of rye on at least part of the land seems to be one of the most promising methods.

STUBBLE TREATMENTS—OLD WEEDY LAND

Due to drought conditions all methods of preparing stubble land for wheat produced low yields this year. Average figures do not indicate that deferred seeding with the object of killing an extra crop of weeds has been effective. In some years this practice has undoubtedly reduced the numbers of weeds, but the benefit derived therefrom has been more than offset by the fact that late seeding is usually more seriously damaged by wireworms, which are present in this land in considerable numbers.

RESULTS FROM STUBBLE TREATMENTS—OLD WEEDY LAND

Field	Crop	Treatment	Yield per acre	
			1929	Average 5 years
			bush.	bush.
1	Wheat	Spring ploughed, harrowed, seeded, harrowed	3·5	10·6
2	Wheat	Spring disked, seeded, harrowed	4·9	12·3
3	Wheat	Spring burned, disked, seeded, harrowed	5·5	12·9
4	Wheat	Spring burned with harrows, disked, seeded, harrowed	5·2	13·4
5	Wheat	Spring burned, disked, cultivated 15 days later, seeded, harrowed	5·2	9·6

DEFERRED CULTIVATION AND SEEDING, OLD WEEDY LAND

Field	Crop	Treatment	Yield per acre	
			1929	Average 5 years
			bush.	bush.
A-9 (a)	Oats	Cultivated early, seeded oats 2½ bushels	8·5	
A-9 (b)	Oats	Cultivated early, cultivated two weeks later, 2½ bushels oats seeded	6·5	39·2
A-10	Wheat	Cultivated early, cultivated two weeks later, one bushel wheat seeded	1·4	7·3
A-11	Wheat	Cultivated normal date, seeded at normal rate	1·5	
B-9 (a)	Oats	Spring ploughed, seeded 2½ bushels oats	8·0	
B-9 (b)	Oats	Spring ploughed, cultivated two weeks later, seeded 2½ bushels oats	6·0	29·3
B-10	Wheat	Spring ploughed, cultivated two weeks later seeded one bushel wheat	1·8	7·4
B-11	Wheat	Normal date of cultivation and seeding	3·0	9·5
B-12	Wheat	Spring ploughed, cultivated two weeks later, one bushel wheat seeded	2·8	

The deferred seeding experiment was designed to learn whether the practice of delaying seeding of wheat and oats two weeks later than the normal date would permit of the destruction of more weeds before seeding and thus make conditions more favourable for the crop. In this case again the chief effect of the delay has been to increase wireworm damage and indirectly by thinning the stand of crop allow space for more weeds. The land is so thoroughly filled with stink weed seeds that even after every effort has been made to reduce their numbers, there are still sufficient numbers left to completely occupy all vacant spaces.

SUMMER-FALLOW TREATMENT—OLD WEEDY LAND

Differences in wheat yields which might be expected to follow different methods of fallowing have been completely obscured by severe wireworm damage to the crops on fallow. Stands of wheat on fallow have been so thinned out by the wire worms that the average yields on fallow are very little greater than the yields on stubble. All treatments conserved sufficient moisture to carry the thin stand left by the wire worms. The only thing that can be said is that no method of summer-fallow now under trial has been at all effective in reducing wire worm damage.

RESULTS FROM SUMMER-FALLOW TREATMENTS—OLD WEEDY LAND

Field	Crop	Plot treatment	Yield per acre	
			1929	Average 5 years
			bush.	bush.
A-6	Wheat	Ploughed June 15, cultivated as required	3·0	10·1
A-7	Wheat	Cultivated only during fallow year	3·2	11·6
A-8	Wheat	Ploughed, harrowed, oats seeded in triple rows	1·2	10·4
B-6	Wheat	Spring ploughed, harrowed, seeded, harrowed	8·6	9·3
B-7	Wheat	Spring ploughed, harrowed, seeded, harrowed	6·0	9·5
B-8	Wheat	Spring ploughed, harrowed, seeded, harrowed	4·2	8·8

HARROWING GROWING GRAIN CROPS—OLD WEEDY LAND

It seems impossible on this land on which the crop is subject to reduction by both weeds and wireworm, to trace any definite relation between harrowing the growing crop and the weed infestation. Harrowing the growing crop has at

times appeared to destroy many young weeds but at the same time this extra working of the soil has appeared to facilitate the activity of the worms, thus making the net result no better than if the harrowing had not been done.

RESULTS FROM HARROWING GROWING GRAIN CROPS—OLD WEEDY LAND

Field	Crop	Treatment	Yield per acre	
			1929	Average 5 years
			bush.	bush.
		On fallow		
A–13	Wheat	Early cultivated, seeded, harrowed just before crop is up.....	2·9	16·6
A–14	Wheat	Early cultivated and seeded, harrowed when crop is 4 inches high.....	1·9	15·9
A–15	Wheat	Early cultivated and seeded.....	3·8	16·6
		On spring ploughing		
B–13	Wheat	Early cultivated, seeded, harrowed just before crop is up.....	2·8	12·1
B–14	Wheat	Early cultivated, seeded, harrowed when crop is 4 inches high	2·8	11·1
B–15	Wheat	Early cultivated and seeded.....	4·2	10·7

FARM MACHINERY, TRIALS AND OBSERVATIONS

Tests and observations of various farm machines for adaptability and efficiency were continued during the 1929 season.

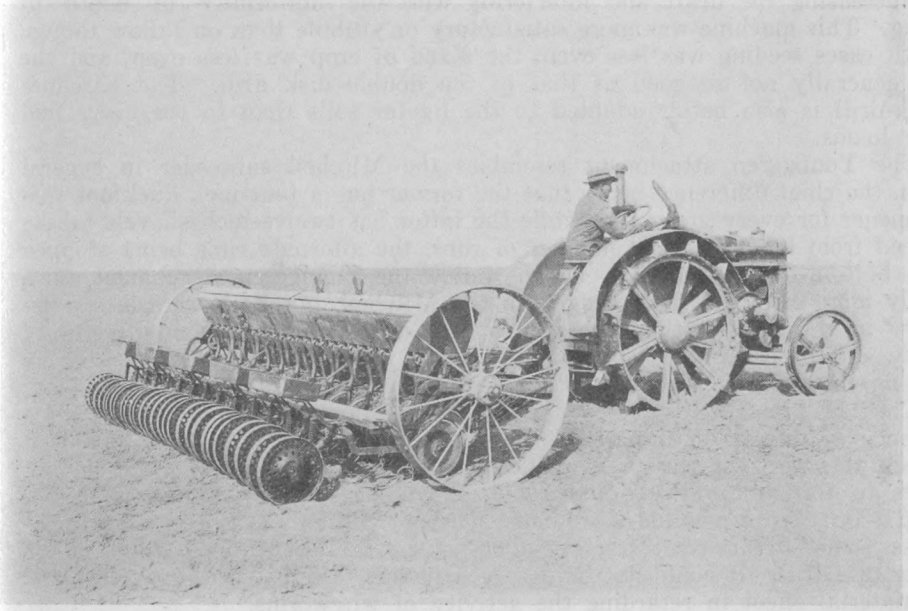
SEEDING MACHINE TESTS

During the seeding season chief attention was devoted to a study of seven different methods of seeding. These included the Standard Double Disk Drill, the Mitchell Subseeder, the Kirchner Seeder Plough, Younggren's Seeder Attachment, the Fertilizer drill, the Standard Press Drill and Press attachment for a standard double disk drill. All methods were on both fallow and stubble land. On the fallow trials, the Mitchell, Kirchner and Younggren machines were used without prior cultivations because these machines are designed to combine the cultivating and seeding into one operation. Other drills were preceded by a duck-foot cultivator. In the stubble test, the Mitchell, Kirchner and Younggren machines were again used without any preparatory treatment of the soil, while the other drills were preceded by the one-way disk.

The land on which these trials were conducted contained a fairly heavy population of wireworms and was infested with French-weed.

A few observations on the performance of each seeding machine in comparison with the Standard double disk drill may help to indicate the advantages as well as the disadvantages of each.

The Mitchell Subseeder performed fairly satisfactorily in both fallow and stubble, though some difficulty was experienced in the fallow through the failure of the subseeders to scour completely. In the stubble there was a slight tendency for trash to accumulate on the shanks just above the ground line. The seeding depth was not as uniform as with the double disk drill nor could it be made so by harrowing or packing after the drill. However, this drill attachment seems to have fair possibilities, especially on moderately light soils or where it is especially desirable to combine the preparatory work and drilling in one operation. From the point of view of wireworms and weed control, no advantage could be detected.



Press attachment behind seed drill.

Younggren cultivator-drill.

Like the Mitchell subseeder the Kirchner plough-drill did not always scour, thus increasing the draft and interfering with the uniformity of depth of seeding. This machine was more satisfactory on stubble than on fallow though in both cases seeding was less even, the stand of crop was less even, and the work generally not so good as that of the double disk drill. The Kirchner plough-drill is also better adapted to the lighter soils than to the clays and heavy loams.

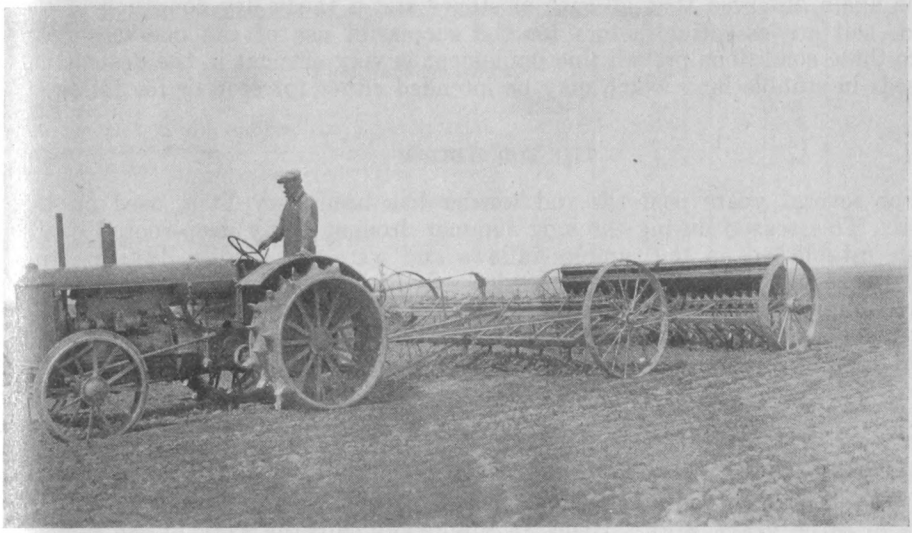
The Younggren attachment resembles the Mitchell subseeder in general design, the chief difference being that the former has a four-inch duckfoot furrow opener for every grain run, while the latter has twelve-inch shovels taking the seed from half the usual number of runs, the alternate runs being stopped in the bottom of the seed-box. On the fallow the Younggren attachment did a slightly more even job of seeding than the Mitchell, but both were less satisfactory in this respect than the double disk drill. Due to accumulations of stubble and trash on the numerous shanks of the Younggren attachment, it could not be used on stubble land.

The low press drill did very satisfactory work. However, practically no difference in rate of germination or evenness of stand could be observed as between the work of the press drill and the double disk. This, of course, applies to the soil and seasonal conditions under which the test was conducted. It is quite possible that under special conditions the press drill might possess some advantages which would justify the extra draft involved in pulling this drill. It could not be observed in this test that the press drill had any material effect in retarding the activity of wireworms.

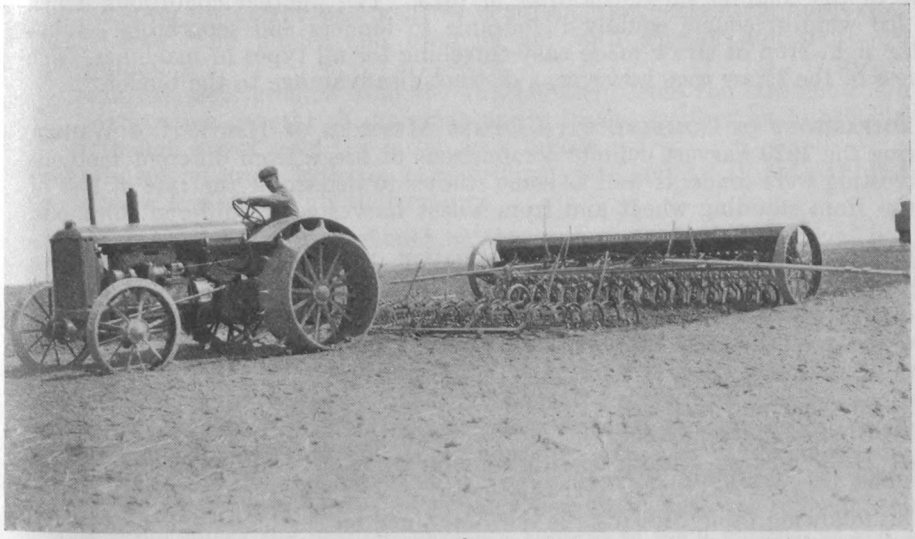
The action of the standard drill with a press attachment was very similar to that of the press drill. The press attachment interfered to a small extent with the normal adjustment and operation of the drill. Some inconvenience in filling the seed-box was experienced. The press attachment added about 200 pounds to the draft of the drill. Since the 28-run drill upon which the attachment was used has a draft of about 800 pounds—a full six-horse load—continued use of the press attachment would require the use of eight good horses. On this basis, the width of drill per horse used is the same as for the low press drill.

The fertilizer drill was included in this test for the purpose of comparing the effect of the fertilizer in stimulating early growth with that of the various drills, especially those which included some packing feature. The fertilizer undoubtedly stimulated a more vigorous early growth of the wheat crop, thus reducing the wireworm damage and resulting in a better stand of wheat. The drill itself was designed for Eastern Canadian conditions and was not entirely adapted to the conditions under which it was tested. However, a few changes, which could readily be made, would permit this drill to work quite satisfactorily under conditions prevailing in this area.

In order to further test out the possibilities of combining tillage and seeding operations, an attempt was made to attach a seed-box to a one-way disk and deliver the seed into the furrow opened by each disk and have it covered by the adjacent disk. This plan did not prove satisfactory for several reasons. The seed boots which were placed between the disks so obstructed the passage of stubble and soil that the whole gang was constantly being plugged by the accumulation of trash and soil. The feed shaft of the seed-box was driven from the disk gang shaft. Since the rate at which the disks turned varied with the type and condition of the soil, the rate of seeding also varied. In fact the seeding stopped entirely at times. Some of these difficulties could be overcome by driving the feed shaft from one of the wheels and by broadcasting the seed ahead of the disks. This method of seeding, however, is of doubtful value, especially in a dry season. Further tests of this outfit will be made next season.



Cultivator and drill in combined hitch, preparing and seeding fallow at the rate of four acres per hour.



Spring-tooth harrow and drill in combined hitch, preparing and seeding fallow at the rate of four acres per hour.

THE ONE-WAY DISK

The one-way disk was again used with satisfactory results both in the preparation of stubble land for seeding and for the first work on the summer-fallows. It was again observed that absence of stones and a fairly dry condition of the surface soil are essential factors for the successful use of the one-way disk. Where these conditions prevail this implement is very efficient in the destruction of weeds in stubble land which may be intended either for crop or for fallow.

THE ROD WEEDER

For several years past the rod weeder has been very little used on the station. This season during the long summer drought many deep-rooted weeds became established on the summer-fallows and were not readily destroyed by the ordinary cultivator. The rod weeder was found very effective in cleaning up such fallows. Moreover, the soil a few inches below the surface is left in a fairly solid condition, which condition seems to decrease wireworm damage to wheat crops on fallow.

THE COMBINED HARVESTER-THRESHER

Experiments with the "Combine" have now covered a period of eight years at this Station. At the end of 1928 a bulletin was published giving the results of seven years' work. Hence in this report only the work of the current year will be dealt with.

THE SEASON—CROP CONDITIONS.—Weather conditions throughout the 1929 harvest season were almost continuously favourable to the use of the Combine. Crops were mostly sufficiently free of weeds to permit the combine to make a good job of threshing and separating. Wheat ripened early and evenly. The bulk of straw was small. All these conditions contributed to the undoubted success of the combine on the prairies in 1929. The weather conditions which prevailed were of course equally favourable to binders and separators. Likewise the light crop of straw made easy threshing for all types of machines. The shortness of the straw was, however, a distinct disadvantage to the binder.

COMPARISONS OF COMBINE WITH OTHER METHODS OF HARVESTING WHEAT.—During the 1929 harvest definite comparisons of losses from different methods of harvesting were made as well as some studies to determine the rate of loss of moisture from standing wheat and from wheat harvested by different methods.

HARVESTING LOSSES.—In this investigation the following methods were compared first on a short-strawed crop producing an average yield of 5·9 bushels of wheat per acre and second on a crop of better length with an average yield of 13·1 bushels per acre:—

(1) Straight combine.
(2) Swather and pick-up.
(3) Binder and separator.
(4) Header-barge (threshed with combine).

The following table presents the data obtained on the losses connected with the methods of harvesting:—

Losses of Wheat Resulting from Different Methods of Harvesting

Method of harvesting	Yield secured per acre	Total loss per acre	Total yield per acre	Percentage loss
	bush.	bush.	bush.	
Field No. 3 (long straw)				
Straight combine	13·39	0·23	13·62	1·69
Swather and pick-up with combine	14·19	0·81	15·00	5·42
Binder and separator	10·64	0·90	11·54	7·78
Header and barge	12·30	0·14	12·44	1·14
Field No. 6 (short straw)				
Straight combine	6·45	0·30	6·75	4·40
Swather and pick-up with combine	6·85	1·07	7·92	13·55
Binder and separator	4·49	2·11	6·60	31·97
Header and barge	6·14	0·17	6·31	2·70

In determining the losses shown in the above table, lost grain from representative areas after each harvesting method was recovered. Details of this procedure need not be given here, but it may be stated that canvases were used at all possible points on the machines and on the ground to recover losses from definite areas. Where a canvas could not be used, heads and shelled grain were picked up from representative square-yard areas. The total of grain so recovered was added to that actually harvested to arrive at the gross yield. In the table the losses are shown both in bushels per acre and in percentages of the gross yield. Several conclusions which are in harmony with general experience may be reached. These are:—

(1) The losses both in bushels and in percentage of the total are highest in short crops.
(2) The losses by the binder method are relatively greater in short than in upstanding crops; that is to say, as the condition of the crop with respect to height and general condition for harvesting improves, the losses from binder and combine are both smaller and more nearly alike.
(3) Losses were greater from the swather than from the straight combine. The same general observations apply to the swather as to the binder, though losses from the latter were higher.
(4) Losses of grain with the header barge were small. In both fields they were less than with the combine.

In general, great caution should be observed in applying these loss figures, because several years' work has indicated that losses of grain by any method of harvesting are greatly influenced by the condition of the crop, time of harvesting and weather.

Moisture Content of Wheat During Harvest Time.—The purpose of this study was to determine the rate at which wheat harvested by different methods lost moisture from the time binder cutting started until combines could be used. A fairly uniform field of wheat was selected, definite areas were harvested at two-day intervals with the binder, swather, and header-barge, beginning on August 15 and continuing until August 19. On August 21 the standing grain was fit for the combine, so no cuttings were made with the other machines.

The table shows the original moisture content of each cutting at the time it was made as well as the moisture content on the dates on which successive cuttings were made. Samples were taken at 11 o'clock each day. An attempt was made to get representative samples for moisture tests by taking a large number of small samples. Even with this precaution, the figures would indicate

that samples were not entirely representative. On August 16 there was a light shower which, however, did not stop general harvest work. Maximum temperatures ranged from 70° F. to 92° F. Moderate southwest winds prevailed and evaporation was fairly high.

MOISTURE CONTENT OF STANDING WHEAT AND OF WHEAT HARVESTED BY DIFFERENT METHODS ON SUCCESSIVE DATES—FIELD NO. 3

Method of harvesting	Date of harvesting	Per cent moisture in wheat on different dates				Per cent moisture in standing crop, Aug. 21
		Aug. 15	Aug. 17	Aug. 19	Aug. 20	
Swather	Aug. 15	31·3	25·2	12·1	11·6	16·6
Binder	Aug. 15	31·3	21·6	13·3	12·0	
Header and barge	Aug. 15	26·6	28·7	12·3	11·6	
Swather	Aug. 17	.....	27·0	15·7	17·6	
Binder	Aug. 17	.....	27·0	22·6	16·9	
Header and barge	Aug. 17	.....	27·0	16·8	13·6	
Swather	Aug. 19	.....	.....	27·0	17·5	
Binder	Aug. 19	.....	.....	27·0	13·2	
Header and barge	Aug. 19	.....	.....	27·0	16·4	
		FIELD NO. 6				
Swather	Aug. 15	18·6	18·2	10·2	9·6	9·3
Binder	Aug. 15	17·1	15·1	9·9	9·5	
Header and barge	Aug. 15	18·4	16·4	10·1	10·0	
Swather	Aug. 17	.....	17·2	10·2	10·2	
Binder	Aug. 17	.....	17·2	10·4	11·4	
Header and barge	Aug. 17	.....	17·2	11·0	10·0	
Swather	Aug. 19	.....	.....	17·2	9·6	
Binder	Aug. 19	.....	.....	17·2	9·5	
Header and barge	Aug. 19	.....	.....	17·2	10·6	

While the figures are not entirely consistent, it is evident that during the six days following August 15 the standing crop lost moisture much more slowly than that which was cut by any method.

Sampling errors were evidently too great to permit of any accurate comparisons between the three methods of harvesting. In the 1928 experiments under much less favourable weather the rate of loss of moisture from standing grain was about the same as from that which had been cut by binder or swather. If weather is hot and dry the cut grain will lose moisture more rapidly than standing grain. If conditions do not favour very rapid evaporation the rate of loss will not be very different.

THE COMBINE ON THE PRAIRIES IN 1929.—While final reports of sales of combines have not been received from all of the companies, it is estimated that in 1929, 2,914 combines were sold in the three Prairie Provinces, distributed as follows: Saskatchewan 2,098, Alberta 673, and Manitoba 143. Of all the machines sold this year 60 per cent were in the group of 15 to 16·5-foot width of cut, 30 per cent were 12-foot cut machines, and the other 10 per cent was made up of 8, 10, 20 and 34-foot widths.

Based on actual acreages cut by owners who reported their operations, it is estimated that the average acreage harvested per combine was 615. This means that out of a total of approximately 23 million acres of wheat on the prairies, combines harvested about 3·5 millions, and of other crops such as rye, flax, oats and barley, about one-half million acres. The following table shows the distribution of combines by provinces since 1922:—

TOTAL NUMBER OF COMBINES IN WESTERN CANADA BY PROVINCES

Province	1922	1923	1924	1925	1926	1927	1928	1929
Alberta	.....	.....	.....	.....	23	218	1,280	1,953
Saskatchewan	2	2	5	18	174	549	2,871	4,969
Manitoba	.....	.....	.....	.....	2	24	190	333
Total	2	2	5	18	199	791	4,341	7,255

During the 1929 season there were fewer complaints of serious difficulties with combines, in proportion to numbers in use, than in any previous year. Farmer users are very generally convinced that they made material savings of grain this season in addition to the savings in operating costs which have been well recognized for some time. From all reports and interviews it is evident that grades for combine wheat were practically the same as for binder-cut wheat. The swather was used to only a limited extent this season, its use being confined to a few uneven or weedy crops and to districts where frosts were feared.

The header-barge and various other adaptations of existing harvesting machinery were used by farmers who had short crops but were unable to secure the use of combines. More than the usual amount of custom work was done by combines. Some dissatisfaction to owners of crops resulted from this work when the returns revealed yields scarcely more than sufficient to pay the custom rate of combining.

THE FUTURE OF THE COMBINE.—In the open plains region of Western Canada the future of the combine seems assured. While changes and modifications both in machines and cropping practices will be made, the combine operators who have had fairly extensive experience are almost unanimous in stating that they expect to continue using the combine.

In park land and bush districts the future is not so clear. In these districts if the combine is to advance materially the swather or some other modification of combine practice will have to be adopted. Until brush land has been fully cleared of roots, the swather and pick-up cannot be used safely, so that present methods will continue for some time. Likewise in districts where oats, barley or rye is an important crop the use of the swather will likely be necessary. If the combine is to be used extensively on oat crops the problem of saving straw should receive serious consideration. Farmers who are outside of the now fairly well defined combined territory should consider many angles of the situation in addition to cost before purchasing combines. Those who are within recognized combine areas need to give most thought to financial problems and savings involved in the purchase of these machines.

HORTICULTURE

The season of 1929 was the most unfavourable for horticultural work yet experienced at this Station. The prolonged drought in the latter half of 1928 together with wide fluctuations in temperature in the months of April and May, 1929, caused considerable losses among the trees and shrubs. One good rain in June started a good growth of all uninjured trees and shrubs, but hot, dry weather later did not permit of a continuance of growth. Leaves fell early with buds poorly developed. Trees especially are in a still more weakened condition at the end of this season than they were last year.

VEGETABLES

BEAN VARIETIES

Twenty-one varieties were planted on May 8. The first seedlings did not appear above ground until June 3. Yields were fairly good considering the dry

season. The wax varieties seem to withstand dry seasons better than the green pod sorts, both as to yield and ability to remain free from stringiness when exposed to prolonged hot dry periods. Among the best wax varieties were Interloper, Challenge, Pencil Pod, Black Wax and Hodson's Long Pod. The Masterpiece and Stringless Green Pods were the best kinds among the green podded variety.

BEANS—DISTANCE OF PLANTING

Seeds of two varieties of beans were spaced at intervals of two inches, four inches and six inches in thirty-foot rows. The Round Pod Kidney Wax Variety produced its highest yield of 8 pounds one ounce from the two-inch spacing. The Stringless Green Pod variety produced its best yield of 7 pounds 4 ounces when the seed was spaced six inches apart in the row. In previous years the thickest planting of either wax or green pod varieties here produced the highest yield of green beans with no material effect on the size of the pod.

BEETS—VARIETY TEST

Four types of beets were included in the project and appear as follows in order of merit: (1) Detroit Dark Red, turnip-shaped beet, (2) Half Long, a medium long variety, (3) Improved Dark Red, long variety, (4) Early Egyptian, a plot variety. The long type varieties tend to become rough and coarse when grown in dry seasons, while the flat varieties tend to split under similar conditions.

BEETS—DATES OF SEEDING

Beginning on April 25, five sowings of Detroit Dark Red variety were made with intervals of ten days between planting. The first sowings produced first roots ready for use August 1. The third sowing of May 16 yielded its first roots fit for use on August 7. The seed of the last two sowings failed to germinate. Beets most suitable for winter storage purposes are usually obtained from the later sowings.

BORECOLE OR KALE—VARIETY TEST

This vegetable has been grown for several seasons with good success. Two varieties are grown, Tall Green and Dwarf Green Curled. The Dwarf Green variety is preferred since it lacks the coarse stalk that characterizes the Tall Green variety.

BRUSSELS SPROUTS—VARIETY TEST

Seven varieties are included in the test, but only one, Long Island Improved, produced edible sprouts. Usually the growing season is not long enough to produce any reasonable quantity of well developed sprouts. The Long Island variety, however, has given encouraging results during the past two years.

CABBAGE—VARIETY TEST

The seed for this test was started in flats under glass March 26, pricked out first week in April and transplanted outdoors May 28. The season was not as favourable to this vegetable as has been the case for several years past. Splitting of heads was noticeably absent.

CABBAGE—RESULTS OF VARIETY TEST

Variety	Average weight per head 1929	Average five years
	lb.	lb.
Glory of Enkhuizen	6·62	9·71
Succession	3·81	8·31
Kildonan	4·00	7·91
Early Winnigstadt	2·00	*6·75
Prandon Market	3·00	7·10
Danish Ballhead (short stem)	4·06	7·28
Summer Ballhead	.....	6·32
Danish Roundhead	.....	5·93
Golden Acre	3·62	*6·28
Early Paris Market	.....	*5·01
Babyhead	2·62	*5·56
Copenhagen Market	3·81	5·72
Improved American Savoy	1·56	5·23
Early Jersey Wakefield	3·25	4·50
Ex. Amager Danish Ballhead	4·00	4·44
Danish Ballhead	5·18	4·80

*Indicates four-year average.

CABBAGE—DATES OF SEEDING AT TEN-DAY INTERVALS

The first day of seeding was April 24 followed by four seedings at intervals of ten days. In previous years it has been possible to obtain cabbage of either early or late varieties fit for winter storage from seed sown in the open. This season the Copenhagen Market, an early variety, was successful. Later varieties such as Danish Ballhead apparently are not dependable in hot dry seasons.

CABBAGE—RESULTS OF DATES OF SEEDING AT TEN-DAY INTERVALS

Variety	Sowing	Yield per 30-foot row		Remarks for 1929
		1929	5-year average	
		lb.	lb.	
Copenhagen Market	1st	66	74	Many split.
Copenhagen Market	2nd	26	65	Many split.
Copenhagen Market	3rd	18	56	None split.
Copenhagen Market	4th	9	50	None split.
Copenhagen Market	5th	none	21	None headed up
Danish Ballhead	1st	none	40	None headed up
Danish Ballhead	2nd	none	55	None headed up
Danish Ballhead	3rd	none	36	None headed up
Danish Ballhead	4th	none	18	None headed up
Danish Ballhead	5th	none	8	None headed up

CARROTS—VARIETY TEST

Seeds of six varieties representing both short and half-long types were sown on April 25. All were up by May 28. Among the half-long types Chantenay is recommended. For hard dry soil conditions short varieties such as Oxheart or Early Scarlet Horn are more desirable.

CARROTS—DATES OF SEEDING

Five sowings of the Chantenay variety were made at ten-day intervals commencing April 25. The first two plantings produced vegetables that were ready for the table on August 28, which was three days earlier than the third sowing. The first three sowings also produced the most suitable sized roots for winter storage, those of the later seeding yielding very small vegetables.

CELERY—VARIETY TEST

Seeds of ten varieties were started in flats under glass on March 2 Germination was fair. Plants were pricked out April 24 and transplanted t prepared trenches on June 6. Earth blanching was used. The following varie ties appear in order of merit. (1) New Golden or Wonderful (2) Paris Golde Yellow (3) Easy Blanching (4) Emperor.

CORN—VARIETY TEST

Of the eleven varieties of table corn tested this year Pickaninny prove earliest. Sixty-day Make Good was almost as early and of somewhat bette quality. The best of the later varieties were Early Malcolm, Sixty-Day Golde and Alpha.

LETTUCE—VARIETY TEST

Seeds of ten varieties of leaf lettuce and ten varieties of head or cabbage lettuce were sown on April 25. Germination was only fair due to dry soil condi tions. Early June rains favoured the crops. The varieties developed unusually firm heads. Leaf varieties recommended are Grand Rapids and Black Seeded Simpson. Among the best head varieties were Iceberg, Brittle Ice, New York and Wonderful. Among the novelties Tom Thumb and Paris White Cos proved very desirable.

ONIONS—TEST OF VARIETIES GROWN FROM SEED

Seed of eleven varieties were sown April 25. Germination was very slow. The first seedlings appeared above ground May 29. The best varieties in points of yield and size were Large Yellow Prize Taker, Large Red Weathersfield and Yellow Globe Danvers.

PARSNIP—VARIETY TEST

Two varieties, Hollow Crown, a long type, and XXX Guernsey, a half long type, were grown. The XXX Guernsey produced the highest yield and being half long were also more suitable to dry soil conditions.

PARSNIPS—DATES OF SEEDING

Five sowings at ten-day intervals were made with seed of Hollow Crown commencing on April 25. The first sowing germinated and showed above ground May 30. The second sowing germinated and showed above ground four days later. Best yields of fair sized roots were obtained from the earliest sowing. The germination of the last sowing, done on June 6, was very poor.

PEAS—VARIETY TEST

Thirteen varieties which included Early, Medium Early and late Maturing sorts were grown, the best Early being Pedigree, Thomas Laxton and English Wonder. The best Medium Early variety was Lincoln and the best late was Stratagem.

PEAS—DISTANCE OF PLANTING

Three varieties were used in this test, namely, Thomas Laxton, English Wonder and Improved Stratagem. Each variety was planted in 30-foot rows, the distances apart in the row being one inch, two inches and three inches. As has been the case in previous years the highest yield was obtained from the closest spacing, but no difference was observed in size of the pea or filling of the pod.

POTATO VARIETIES

Epicure up till this year has been the leading variety in yield. It matures very early. The newly matured tubers have a tendency to sprout if not harvested very early. Early Sunrise, Gold Nugget and Bovee are very good varieties, but have only been tested two years. Irish Cobbler and Early Ohio are two dependable main crop varieties.

RESULTS OF TEST OF POTATO VARIETIES

Variety	Yield per acre	
	1929	Six-year average
	bush.	bush.
Epicure	193	338
Houghton Rose	224	317
Carter Early Favourite	273	310
Irish Cobbler	243	305
Wee McGregor	211	299
Duchess of Norfolk	130	253
Early Ohio	252	249
Early Sunrise	221	306*
Gold Nugget	266	291*
Early Six Weeks	247	279*
Bovee	266	287*
Netted Gem	139	192*
Bliss Triumph (Unit 15)	224	236*
King George V	261	234*

*Indicates two-year average.

RADISH—VARIETY TEST

Of the eight varieties tested the Icicle variety was outstanding this year in that it retained its mild flavour for a very long period when all the other varieties had ceased to be edible. Dry seasons such as experienced this year usually cause radishes to take on a bitter flavour soon after they are ready for the table. Other varieties in the test that were good in the early season were Saxa, Chartier and Turnip White Tip.

SQUASH-PUMPKIN—VARIETY TEST

The season was much too hot and dry for these vegetables. Golden Hubbard Squash was the only kind to approach maturity with fruits of a fair size.

TOMATO—VARIETY TEST

Thirty varieties were tested. These were started in flats under glass March 19 and pricked off into paper pots during the first week of April. On June 5 they were transplanted to outdoor beds. On the whole the season was favourable to tomatoes particularly during ripening period. Australian Dwarf was the outstanding variety this year in yield of ripe tomatoes. Other good sorts were Marvana, Canadian, Burbank A X BB and Landreth.

ORNAMENTALS

TREES AND SHRUBS

Trees and shrubs were unusually slow to leaf out this year. Considerable damage was found among the Russian Poplar which may be attributed to the effects of heavy infestation of aphids the year previous and probably to some extent damage by severe spring frosts which immediately followed a few days of

good growing weather. Quite a number of Golden Willows, Maple and As suffered also from damage by spring frosts. Some winter-killing occurred amon a few of the shrubs as indicated in the tables.

ORNAMENTAL SHRUBS

Variety	Winter-killing	Began to bloom	Bloom over
Ginnalian Maple	Nil		
Siberian Pea Tree	Nil	June 8	June 20
Woody Caragana	Nil	May 31	June 24
Dwarf Caragana	Nil	June 2	June 20
Common Lilac	Nil	June 1	June 24
Josikea Lilac	Nil	June 3	June 21
Villosa Lilac	Nil	June 13	June 27
Halimodendron	Slight	June 28	July 10
Van Houtte Spiraea	Nil	June 26	July 10
Sorbus-leaved Spiraea	Nil	July 15	Aug. 20
Spiraea arguta	Slight	May 27	June 6
Spiraea billardi	Slight	July 19	July 30
Tartarian Honeysuckle	Nil	May 26	June 12
Albert Regel Honeysuckle	Nil	May 26	June 12
Japanese Rose	Considerable	June 24	Aug. 15
Rosa rubrifolia	Considerable	June 20	June 30
Russian Olive	Slight	July 1	July 12
Shrubby Cinquefoil	Nil	June 20	Aug. 15
Missouri Currant	Slight	June 23	July 8
Siberian Dogwood	Considerable	June 12	June 25

PERENNIAL FLOWERS

The perennial border was mulched in the fall with four inches of straw manure. This was removed the following spring after all danger of frost was passed. Some winter killing occured among pansies and Sweet Williams. These, however, were located in beds considerably exposed during the winter. Towards mid-summer many plants suffered from the effects of drought though considerable bloom was obtained from Delphinium, Lychnis, Iris, Peony, Aquilegia, Anchusa, Gaillardia, Linum sibiricum, Coreopsis and Gypsophila. The plants of these varieties are spaced about two feet or more apart in the border in order that they may obtain sufficient soil moisture to enable them to make a satisfactory showing in such dry seasons as occurred this year.

ANNUAL FLOWERS

The season was not favourable to annual flowers started from seed outdoors chiefly due to poor germination caused by dry soil conditions. Such varieties as Stocks, Petunia, Cosmos and Helichrysum which were started in the greenhouse and subsequently planted out-doors made a fair showing, but the summer was much too hot and dry for plants that depend entirely on rainfall for their moisture supply.

SWEET PEAS

Sixty varieties were planted early in the spring. Germination was poor, vines were short and flowers few as compared with previous years.

ROSES

Twenty-four plants of grafted tea, hybrid tea and perpetual roses were planted in spring of 1928. Nearly all made a reasonably good showing in that year. For winter protection the plants were mounded up with earth so that practically all the plant was covered. Old hay was then used to cover the

mound. Nearly all the plants wintered well but were caught by severe frosts in May. Among the surviving plants that are promising are Mrs. John Laing, Frau Karl Druschki, Angele Pernet, Ophelia, Madame Butterfly, General McArthur and Etoile de Holland.

TULIPS

Tulip bulbs planted in October 1928 did not make as good a showing as bulbs which were planted two or three years previously and left in the ground to multiply in a natural way. The early spring single varieties have flowers on very short stems. The Darwins which flowered two or three weeks later, however, made a much better showing probably due to the fact that being a later sort they made their major growth when growing conditions were more favourable. Lady Boreel, Inglescombe Yellow, Proserpine, and Bouton D'or were among the best of the early single kind and Loveliness, Rev. Ewbank, Clara Butt and Baron De La Tonnaye were outstanding in the Darwin class.

DAFFODILS

Unusual success has been obtained with narcissus or daffodils during the past two years. The bulbs were planted in the perennial border in October and covered with 6 inches of rotted manure after the first severe frost. As soon as the spring had well begun the mulch was removed. Four varieties were used namely Emperor, Sir Watkin, Princeps and Golden Spur. These all began to bloom on May 24 and continued until June 11. They provided one of the most attractive spots in the perennial border.

CROCUS

One hundred crocus bulbs were planted in beds in October. The unfavourable early spring which followed a dry fall season, however, rendered conditions unsuitable for these early flowering bulbs.

TREE FRUITS

APPLES

There was practically no damage from winter killing or animal pests. A few fruits were obtained from the following crab varieties Rosilda, Florence, Dolgo and Amur. These varieties were planted as one year old plants in 1926.

PLUMS

All the plums, sand cherries and sand cherry hybrids wintered well. Opata plum, Oka Cherry and the bush or sand cherry produced their first fruit this year. These trees were set out as one year old plants in 1926.

BUSH FRUITS

RASPBERRY BUSHES

Raspberry bushes were severely damaged by spring frosts after the winter mulch of straw had been removed. The Ohta variety survived this setback fairly well. The surviving canes of all varieties produced very little fruit of only medium quality which may be attributed to the hot, dry season.

CURRANT BUSHES

Currant bushes were very little damaged by winter killing or spring frosts. Eagle, Kerry O-2388 and Collins Prolific were among the best yielding black sorts. Victoria, Red Dutch O-2305, and Greenfield were excellent among the red varieties. The white varieties did not yield well.

GOOSEBERRIES

Three varieties Mabel, Carrie and Houghton all wintered well. Infestation by insects compelled early picking of fruit to permit spraying with arsenate of lime. Good yields of fruit, however, were obtained.

STRAWBERRIES

Strawberry plants were protected with a mulch during the winter and the plants wintered through safely. The hot dry summer, however, was not favourable to the development of fruit, the berries being small and the yield very light.

WINTER KILLING AND SURVIVAL OF FRUIT TREES PLANTED DURING AND AFTER 1926

Name	How wintered			Where obtained	Remarks
	Total trees planted	Number winter-killed	Number of survivals		
Standard Apples					
Moscow Pear	3	2	1	C.E.F., Ottawa	
Charlamoff	3	2	1	Pine Grove	
Rosy Repka	3	3	0	C.E.F., Ottawa	
Anis	3	2	1	C.E.F., Ottawa	
Hibernal	8	3	5	Exp. Station, Morden	
Dudley	2	2	0	Pine Grove	
White Russet	3	3	0	C.E.F., Ottawa	
Blushed Calville	3	3	0	C.E.F., Ottawa	
Antonovka	3	3	0	C.E.F., Ottawa	
Pine Grove Red	3	0	3	Exp. Station, Morden	
Simbirsk	3	3	0	C.E.F., Ottawa	
Ostrakoff	3	3	0	C.E.F., Ottawa	
Totals	40	29	11		
Crab Apples					
Osman	12	1	11	Exp. Station, Morden	Made extra strong growth.
Printosh	3	3	0	C.E.F., Ottawa	
Piotosh	3	1	2	Exp. Station, Morden	
Rosilda	3	0	3	Pine Grove	Produced a small quantity.
Amur	6	3	3	Exp. Station, Morden	Produced its first fruit in 1929.
Robin	5	0	5	Exp. Station, Morden	In good condition.
Anoka	6	5	1	Carl Hansen	
Perkin	5	2	3	Exp. Station, Morden	
Dolgo	3	1	2	Exp. Station, Morden	Produced its first fruit 1929.
Transcendent	2	0	2	Exp. Station, Morden	In fair condition.
McPrince	3	3	0	C.E.F., Ottawa	
Columbia	3	1	2	Exp. Station, Morden	
Bedford	3	3	0	C.E.F., Ottawa	
Columbian	2	2	0	C.E.F., Ottawa	
Elkhorn	3	3	0	C.E.F., Ottawa	
Selwyn	3	3	0	C.E.F., Ottawa	
Totals	65	31	34		
Cherries					
Compass	3	1	2	Patmore's	
Champa	1	0	1	Not in record	
Oka	3	0	3	Carl Hansen	First fruit 1929 produced an average crop; very healthy.
Orel	3	3	0	C.E.F., Ottawa	
Bush	12	1	11	Patmore's	Produced heavy crop of fruit, not much of a cherry. Bushes made strong growth.
Tom Thumb	5	5	0	Pine Grove	
Totals	27	10	17		

WINTER KILLING AND SURVIVAL OF FRUIT TREES PLANTED DURING AND AFTER 1926—*Concluded*

Name	How wintered			Where obtained	Remarks
	Total trees planted	Number winter-killed	Number of survivals		
Plums					
Mammoth	6	5	1	Pine Grove	
Opata	5	0	5	Pine Grove	Produced a small quantity of fruit 1929, made strong growth.
Sapa	5	3	2	Patmore's	
Assiniboine	3	0	3	Exp. Station, Morden	In fair condition.
Hanska	5	3	2	Patmore's	
Waneta	5	5	0	Patmore's	
Pembina	4	4	0	Pine Grove	
Cheney	2	1	1	Pine Grove	
Totals	35	21	14		

INSECT PESTS

The Yellow Spotted Slug—*Pteronies rentralis*

This pest which attacked willows last year and was checked with a spray of arsenate of lime did not appear this year.

Poplar Leaf Beetle—*Lina Scripta*

This beetle is numerous on Russian Poplar, also severely infesting Coreopsis. It is controlled by spraying with arsenate of lime and burning leaves in the fall.

Caragana Blister Beetle—*Lyatta nutalli*

The Caragana Blister Beetle is numerous on Caragana, Halimondendron, Honey Suckle and Garden beans. Damage was curtailed by several applications of Arsenate of Lime.

American Elm Aphis—*Schozoneura americana*

Infestation slight. Controlled by picking and destroying infested leaves.

Mourning Cloak Butterfly—*Nanessa antiopa*

Caterpillars attacking Poplar, capable of doing considerable damage. Controlled by spraying arsenate of lime and hand picking.

CEREALS

WHEAT

COMMON SPRING WHEAT—TEST OF VARIETIES AND STRAINS, 1929

1/50-acre plots triplicated—Sown on fallow, April 27

Accession number	Variety	Date ripe	Height at harvest	Yield per acre	Weight per measured bushel at separator
			in.	bush.	lb.
32	Reward S.C. 1	Aug. 4	33	22·7	58·0
32	Reward, Ott. 928	" 4	34	22·1	58·3
39	Supreme	" 12	37	21·1	58·7
31	Garnet, Ott. 652	" 4	35	20·1	53·2
125	Reliance	" 11	36	19·0	55·0
128	Renfrew	" 15	38	18·7	53·7
126	Ceres	" 12	36	18·5	55·0
103	Marquis, Ott. 15	" 12	34	18·5	54·3
170	Marquis, 10B	" 12	36	17·8	54·3
37	Kitchener	" 15	34	17·7	56·2
101	Early Red Fife, Ott. 16	" 15	37	17·3	57·8
132	Red Fife, Ott. 17	" 16	35	16·5	57·3

DURUM WHEAT—TEST OF VARIETIES AND STRAINS, 1929

1/50-acre plots triplicated—Sown on fallow, April 27

Accession number	Variety	Date ripe	Height at harvest	Yield per acre	Weight per measured bushel at separator
			in.	bush.	lb.
24	Kubanka, Ott. 37	Aug. 13	43	15·5	57·2
133	Mindum	" 13	43	15·0	55·8

SPRING WHEAT—VARIETIES AND STRAINS

Comparative yield for a number of years

Variety	1922	1923	1924	1925	1926	1927	1928	1929	Average for years grown	Average for Marquis for same years	Comparative yields in per cent of Marquis for same years
	bush.	bush.	bush.	bush.	bush.	bush.	bush.	bush.	bush.		
Ceres	.....	.....	.....	.....	.....	43·5	46·9	18·5	36·3	33·3	109·0
Garnet, Ott. 652	.....	.....	.....	26·5	31·1	39·1	45·7	20·1	32·5	30·8	105·5
Supreme	32·0	26·0	18·2	26·8	32·6	39·7	48·6	21·1	30·6	29·0	105·5
Kitchener	38·0	22·6	19·9	28·0	33·0	37·4	44·8	17·7	30·2	29·0	104·1
Reliance	.....	.....	.....	.....	.....	43·1	41·7	19·0	34·6	33·3	103·9
Mindum	.....	.....	.....	.....	.....	39·1	47·1	15·0	33·7	33·3	101·2
Marquis, Ott. 15	32·0	27·5	18·6	23·3	31·0	39·3	42·0	18·5	29·0	29·0	100·0
Kubanka, Ott. 37	37·3	26·0	19·8	24·5	33·2	34·1	41·5	15·5	29·0	29·0	100·0
Early Red Fife, Ott. 16	30·7	22·3	18·6	27·2	28·5	32·2	44·8	17·3	27·7	29·0	95·5
Red Fife, Ott. 17	28·4	22·2	21·2	.....	.....	36·8	39·9	16·5	27·5	29·0	92·9
Reward, Ott. 928	.....	.....	.....	22·0	29·5	34·4	34·6	22·1	28·5	30·8	92·5
Renfrew	.....	.....	.....	.....	.....	38·2	34·2	18·7	30·4	33·3	91·3

In examining the data from the wheat variety tests, is is interesting to note that the early varieties were at the top this year both with respect to yield and weight per measured bushel. This result is attributable to the fact that the favourable June rainfall produced a growth of straw in the later varieties which could not be sustained by the scant July rains. All varieties suffered in the same way but the early ones escaped with lighter damage than those that were later in ripening.

In the table in which are shown the comparative yields of different varieties for all years each has been under test, the later varieties such as Marquis and Supreme stand higher in yield than most early varieties. Ceres, Garnet, Supreme and Kitchener are the only varieties which outyield Marquis and then only to the extent of four to five per cent. All of these varieties have other characteristics such as poorer quality, weaker straw, tendency to shatter or susceptibility to rust which make them inferior to Marquis for general use in southwestern Saskatchewan. Mindum, one of the best varieties of Durum wheat, has produced about the same average yield as Marquis, but due to the fact that it usually brings a somewhat lower price than Marquis there is no advantage in growing it, especially when the danger of degrading common wheat through accidental mixing is considered.

New seed storage and cleaning plant.

OATS

Oats—Test of Varieties and Strains

1/50-acre plots triplicated—Grown on fall-ploughed oat stubble

Variety	Date ripe	Height at harvest	Yield of grain per acre	Weight per measured bushel at separator
		in.	bush.	lb.
Banner, Ott. 49	Aug. 6	22	20·6	33·0
Alaska	" 1	23	20·1	35·0
Leader	" 6	23	20·0	31·0
Cole	" 1	21	18·6	35·0
Daubeney, Ott. 47	" 1	20	17·2	36·0
Laurel, Ott. 474	" 5	22	16·9	47·0
Gopher	" 1	18	15·4	36·0
Victory	" 6	19	14·6	33·0
Abundance	" 6	21	14·0	32·5
Gold Rain	" 7	18	13·7	33·0
Longfellow, Ott. 478	" 7	24	13·0	36·0
Gerlach	" 7	19	12·0	33·0
Markton	" 5	18	9·3	34·0
O.A.C. No. 72	" 7	20	7·2	32·0

OATS—TEST OF VARIETIES AND STRAINS
1/50-acre plots triplicated—Sown on fallow April 29, 1929

Variety	Date ripe	Height at harvest	Yield of grain per acre	Weight per measured bushel at separator
		in.	bush.	lb.
Cole	Aug. 1	26	34·1	29·6
Daubeney, Ott. 47	" 1	29	34·1	30·8
Markton	" 6	30	33·7	31·0
Banner, Ott. 49	" 6	31	33·3	25·2
Gopher	" 1	27	33·0	32·0
Longfellow, Ott. 478	" 7	32	30·5	30·0
Alaska	" 1	28	28·6	35·3
Victory	" 7	32	28·4	26·2
Gold Rain	" 7	32	28·4	25·7
Gerlach	" 7	30	27·7	23·6
Leader	" 6	30	25·1	25·0
Abundance	" 7	32	24·6	28·2
O.A.C. No. 72	" 7	32	24·5	27·6
Laurel, Ott. 474	" 6	29	23·0	46·0

OATS—TEST OF VARIETIES AND STRAINS
Comparative yields for a number of years—grown on fall-ploughed oat stubble

Variety	Yield per acre							Comparative yield in per cent of Banner for same years
	1925	1926	1927	1928	1929	Average for years grown	Average for Banner for same years	
	bush.	bush.	bush.	bush.	bush.	bush.	bush.	
Banner, Ott. 49	52·2	13·7	82·6	54·3	20·6	44·7	44·7	100·0
Cole	46·3	27·9	72·5	51·2	18·6	43·3	44·7	96·9
Victory	51·4	15·4	73·9	59·8	14·6	43·0	44·7	96·2
Leader	47·4	13·5	79·9	53·4	20·0	42·8	44·7	95·7
Daubeney, Ott. 47	43·3	22·8	71·0	47·3	17·2	40·3	44·7	90·1
Gold Rain	39·2	8·6	86·0	52·5	13·7	40·0	44·7	89·5
Longfellow, O. 478	36·3	16·7	79·1	53·6	13·0	39·7	44·7	88·8
Gerlach	38·7	10·0	78·9	53·0	12·0	38·5	44·7	86·1
Markton	.....	.....	78·2	46·7	9·3	44·7	52·5	85·1
Abundance	41·5	9·6	63·5	48·5	14·0	35·4	44·7	79·2
O.A.C. No. 72	38·9	12·2	77·4	38·3	7·2	34·8	44·7	77·8
Gopher	.....	.....	.....	.....	15·4	15·4	20·6	74·7
Alaska	14·0	15·2	52·9	51·4	20·1	30·7	44·7	68·7
Laurel, Ott. 474	31·2	7·6	59·5	34·3	16·9	29·9	44·7	66·9

OATS—TEST OF VARIETIES AND STRAINS
Comparative yields for a number of years—Grown on fallow

Variety	Yield of grain per acre										Comparative yield in per cent of Banner for same years
	1922	1923	1924	1925	1926	1927	1928	1929	Average for years grown	Average for Banner for same years	
	bush.	bush.	bush.	bush.	bush.	bush.	bush.	bush.	bush.	bush.	
Gopher	.....	.....	.....	.....	.....	.....	89·4	33·0	61·2	52·5	116·5
Gerlach	.....	68·5	51·8	61·7	53·4	91·6	80·2	27·7	62·1	57·8	107·4
Victory	.....	55·0	59·5	56·5	44·6	99·7	70·8	28·4	59·2	57·8	102·4
Gold Rain	70·6	53·5	52·3	63·4	51·4	86·9	75·1	28·4	60·2	60·0	100·3
Banner, Ott. 49	74·8	60·3	33·8	65·2	51·6	89·2	71·5	33·3	60·0	60·0	100·0
Leader	63·5	63·9	.....	63·0	50·9	94·1	59·8	25·1	60·0	60·0	100·0
Longfellow, Ott. 478	.....	.....	32·2	52·1	55·4	85·5	79·8	30·5	55·9	57·4	97·4
Cole	.....	.....	45·0	44·4	35·9	98·2	72·1	34·1	54·9	57·4	95·6
O.A.C. No. 72	71·6	58·8	43·3	58·6	50·2	88·2	61·4	24·5	57·1	60·0	95·1
Abundance	.....	44·3	42·7	55·9	59·4	74·9	68·7	24·6	52·9	57·8	91·5
Daubeney, Ott. 47	68·0	50·4	42·2	48·0	37·0	80·1	69·3	34·1	54·9	60·0	91·5
Markton	.....	.....	.....	.....	.....	73·0	52·8	33·7	53·2	64·7	82·2
Alaska	55·1	47·1	39·3	41·5	.....	67·1	67·1	28·6	49·4	61·2	80·7
Laurel, Ott. 474	.....	.....	.....	36·7	47·0	71·5	65·4	23·0	48·7	62·2	78·3

Comparative tests of oat varieties are carried on both fallow and stubble land. It is interesting to note that the same varieties do not stand a the top of the list on both soil preparations.

In the two years in which it has been under test Gopher has been at the head of the list on summer-fallow and near the bottom on stubble land. Gerlach and Victory have outyielded Banner on summer-fallow but Banner has been the most productive of all varieties grown on stubble. Markton, a variety introduced from Montana in 1927 has not been a high yielder in either test. Until some of the recent introductions are more thoroughly tested it would be advisable for farmers to continue growing Banner or Victory.

BARLEY

In the barley variety tests yields on stubble land ranged from five to seventeen bushels per acre, while yields on fallow varied from 13 to 33·5 bushels. The average of the fallow being practically double that of the stubble land. Differences in the relative positions of the varieties with respect to yield will be noted in the various tests. In general Hannchen has been the highest-yielding variety, although Trebi is slightly higher in yield than Hannchen, when the comparison is made on stubble land.

Albert barley, which is normally about a week earlier in ripening than Hannchen and Trebi, yielded comparaticely well this year on the stubble land. The earliness of the Albert is a distinct advantage where barley is grown for the purpose of wild oat control.

BARLEY—TEST OF VARIETIES AND STRAINS

1/50-acre plots triplicated—sown on fallow April 30

Variety	Date ripe	Height at harvest	Yield of grain per acre	Weight per measured bushel at separator
		in.	bush.	lb.
Hannchen	Aug. 7	27	33·5	42·0
Gold Swedish	" 7	25	28·3	41·3
Charlottetown No. 80	" 7	28	27·3	42·6
Junior, Ott. 471	July 31	27	26·7	58·3
Duckbill, Ott. 57	Aug. 9	27	25·6	45·6
Trebi	" 3	28	23·5	37·6
O.A.C. No. 21	" 3	33	21·9	41·7
O.A.C. No. 21 Sask	" 3	32	21·9	39·8
Chinese, Ott. 60	" 3	34	21·5	39·3
Albert, Ott. 54	" 1	31	20·3	36·7
Bark's	" 10	26	17·2	40·5
Bearer, Ott. 475	" 9	28	16·1	36·6
Feeder, Ott. 560	" 1	36	13·0	40·7

BARLEY—TEST OF VARIETIES AND STRAINS

1/50-acre plots, triplicated—sown April 30 on fall-ploughed barley stubble

Variety	Date ripe	Height at harvest	Yield of grain per acre	Weight per measured bushel at separator
		in.	bush.	lb.
Albert, Ott. 54	Aug. 1	23	17·2	43·8
Junior, Ott. 471	" 1	20	15·1	60·6
Feeder, Ott. 560	" 1	23	13·0	45·7
Hannchen	" 4	18	10·5	46·1
O.A.C. No. 21	" 5	22	10·1	45·3
O.A.C. No. 21, Sask	" 5	23	9·6	44·5
Duckbill, Ott. 57	" 6	19	8·5	47·0
Gold	" 6	16	8·2	47·8
Chinese, Ott. 60	" 5	22	7·6	44·0
Trebi	" 5	17	7·2	43·3
Bark's	" 6	18	7·0	39·2
Charlottetown No. 80	" 6	16	5·9	46·3
Bearer, Ott. 475	" 6	19	5·0	41·2

BARLEY—TEST OF VARIETIES AND STRAINS

Comparative yields for a number of years—grown on fallow

Variety	Yields of grain per acre									Comparative yields in per cent of O.A.C. 21 for same years
	1922	1924	1925	1926	1927	1928	1929	Average for years grown	Average for O.A.C. 21 for same years	
	bush.	bush.	bush.	bush.	bush.	bush.	bush.	bush.	bush.	
Hannchen	62·5	23·7	44·5	46·8	69·6	38·6	33·5	45·6	41·1	110·9
Trebi	63·3	33·4	36·9	45·7	57·1	51·4	23·5	44·5	41·1	108·3
Gold	.....	.....	.....	34·2	77·4	45·3	28·3	46·3	43·1	107·4
O.A.C. No. 21	48·7	32·3	34·3	34·1	64·6	51·7	21·9	41·1	41·1	100·0
Charlottetown No. 80	.....	31·6	39·3	33·7	68·9	35·2	27·3	39·3	39·8	98·7
O.A.C. 21, Sask	.....	23·4	31·0	37·8	61·8	52·7	21·9	38·1	39·8	95·7
Duckbill, Ott. 57	56·7	17·4	38·2	26·0	64·6	43·1	25·6	38·8	41·1	94·4
Bearer, Ott. 475	.....	21·5	39·6	29·5	75·7	35·7	16·1	36·3	39·8	91·2
Chinese, Ott. 60	48·3	22·6	32·5	29·8	66·8	39·8	21·5	37·3	41·1	90·7
Bark's	61·7	15·1	33·8	19·4	73·4	39·5	17·2	37·2	41·1	90·5
Junior, Ott. 471	.....	20·8	34·8	32·1	51·0	44·2	26·7	34·9	39·8	87·7
Albert, Ott. 54	31·2	15·0	26·1	40·1	57·4	43·1	20·3	33·3	41·1	81·0
Feeder, Ott. 560	.....	17·1	17·5	26·6	57·4	33·9	13·0	27·6	39·8	69·3

BARLEY—TEST OF VARIETIES AND STRAINS

Comparative yields for a number of years—grown on fall ploughed barley stubble

Variety	Yields of grain per acre								Comparative yields in per cent of O.A.C. 21 for same years
	1924	1925	1926	1927	1928	1929	Average for years grown	Average for O.A.C. 21 for same years	
	bush.	bush.	bush.	bush.	bush.	bush.	bush.	bush.	
Trebi	33·4	20·9	22·4	48·4	.....	7·2	26·5	25·1	105·6
Hannchen	23·8	33·8	14·6	46·2	43·3	10·5	28·7	28·0	102·5
O.A.C. No. 21	32·3	16·6	12·3	54·0	42·5	10·1	28·0	28·0	100·0
Albert, Ott. 54	15·0	20·0	18·0	49·3	43·4	17·2	27·1	28·0	96·8
Charlottetown No. 80	31·6	21·8	7·5	48·1	43·7	5·9	26·4	28·0	94·3
O.A.C. No. 21, Sask	23·4	14·6	14·0	55·7	36·5	9·6	25·6	28·0	91·4
Gold	.....	.....	6·9	46·2	46·5	8·2	26·9	29·7	90·6
Chinese, Ott. 60	22·6	13·5	9·7	52·4	44·8	7·6	25·1	28·0	89·6
Feeder, Ott. 560	17·1	16·6	10·6	52·9	33·9	13·0	24·0	28·0	85·7
Bearer, Ott. 475	21·5	21·3	10·2	43·4	42·1	5·0	23·9	28·0	85·3
Junior, Ott. 471	20·8	18·0	8·8	42·9	35·1	15·1	23·4	28·0	83·6
Duckbill, Ott. 57	17·4	18·7	4·5	46·5	31·8	8·5	21·2	28·0	75·7
Bark's	15·1	18·0	4·8	34·7	35·2	7·0	19·1	28·0	68·7

FALL RYE

Six varieties of fall rye were sown on fallow in a triplicate test on August 15, 1928. The seed was slow to germinate and did not become well established before freeze-up due to dry soil conditions. The plots were covered well with snow during a greater part of the winter. The soil, however, was dry during the spring so that the none too well established crop was further retarded in its growth. The rains which fell later in the season came too late to improve the stand.

FALL RYE—TEST OF VARIETIES AND STRAINS

Accession number	Variety	Yield of grain per acre						
		1924	1925	1926	1927	1928	1929	Average for years grown
		bush.	bush.	bush.	bush.	bush.	bush.	bush.
8	Rosen, Sask. 299	41·3	26·7	44·9	62·6	11·2	9·7	32·7
6	Advance, Sask. 668	42·9	25·8	41·8	60·9	13·6	7·3	32·0
9	Dakold, 959	46·6	21·5	43·1	58·8	13·8	7·9	31·9
10	Common	.....	25·6	47·7	58·4	13·4	10·1	31·0
1	Swedish, Sask. 669	44·1	21·1	38·8	56·7	11·2	9·2	30·2

FLAX

In addition to effects of inadequate moisture supply all the varieties were considerably affected by a flax wilt. The percentage of plants lost from wilt ranges from 50 to 75, so that the greatest depreciation in yield was caused by wilt.

FLAX—TEST OF VARIETIES AND STRAINS
Comparative yields for a number of years

Accession number	Variety	Yield of grain per acre							
		1923	1924	1925	1926	1927	1928	1929	Average for years grown
		bush.	bush.	bush.	bush.	bush.	bush.	bush.	bush.
4	Common	19·3	15·4	14·5	15·0	13·9	14·0	3·2	13·6
2	Novelty, Ott. 53	16·5	16·7	14·0	14·9	8·3	16·7	5·1	13·2
1	Premost	16·5	14·3	12·7	14·5	8·9	15·8	4·6	12·3
6	Linota	.....	.....	.....	.....	.....	16·7	4·2	10·4

FIELD PEAS

Yields of peas this year were somewhat lower than average, but in view of the limited rainfall may be considered very satisfactory.

In view of the very satisfactory average yields produced by all varieties grown at this Station it would seem that peas might be profitably grown to a larger extent by farmers. The cost of seed is one adverse factor and harvesting peas is more troublesome and expensive than is the case with oats or barley. If peas are to be grown for feed they can be handled more satisfactorily when sown with oats in the proportion of about two bushels of peas to one of oats per acre.

FIELD PEAS—TEST OF VARIETIES AND STRAINS
Comparative yields for a number of years

Variety	Yield per acre									Comparative yield in per cent of Canada field peas for same years
	1923	1924	1925	1926	1297	1928	1929	Average for years grown	Average for Canada field peas for same year years	
	bush.	bush.	bush.	bush.	bush.	bush.	bush.	bush.		
Mackay Ott. 25	32·9	.....	.....	26·4	39·0	34·6	15·4	29·6	23·0	128·7
Carleton	28·3	44·4	31·4	25·3	39·8	32·9	8·9	30·9	25·1	123·1
Arthur Ott. 18	.....	41·9	25·1	28·0	26·7	38·9	11·6	28·7	26·5	108·3
Dashaway (Sask.)	18·5	42·2	26·2	19·6	34·1	34·6	11·0	26·6	25·1	106·0
Canada Field	17·0	36·7	24·5	20·4	32·6	36·0	8·8	25·1	25·1	100·0
Golden Vine	13·0	31·4	29·1	25·8	36·2	27·9	8·9	24·6	25·1	98·0
Chancellor Ott. 26	19·2	.....	26·2	17·9	31·5	19·4	12·7	21·1	23·2	90·9

FORAGE CROPS

CORN

Since corn variety testing was started at this Station a total of 80 varieties, strains and selections have been tried. Out of this large number it cannot be said that any one is well adapted to conditions which prevail here. The short growing, early sorts such as Squaw and selections from it have reached a more advanced stage of maturity and on the average have produced more dry matter per acre than the taller later varieties. Some selections and hybrids are available now which look more hopeful than anything heretofore tested, but until some of these demonstrate their worth, the corn crop cannot be considered as of any economic importance for the production of fodder. Some of the very early varieties will usually ripen seed. Such varieties may have a possible use for pasturing hogs or other live stock.

CORN—TEST OF VARIETIES FOR FODDER PRODUCTION

Variety	Source	Maturity at harvest	Yield per acre	
			Green weight	Dry weight
			tons	tons
Early Squaw	E. C. Rhodes, Maple Creek	Glazed	4·50	1·28
Falconer Dent	McKenzie	Milk	6·05	1·22
Mandon Zinc White Flint	O. Will	Late milk	5·94	1·18
Minnesota No. 13 Double Cross	Northrupp King	Milk	5·34	1·10
Falconer	O. Will	Late milk	4·55	1·03
Payne's White Dent	J. M. Buckley	Milk	4·46	0·93
Wisconsin No. 7 X Twitchell's	Summerland	Early milk	4·68	0·89
King's Cross	Northrupp King	Milk	3·87	0·89
Extra Early Minnesota No. 13	Northrupp King	Milk	4·04	0·86
Smoky Dent	McDonald's	Tassel	4·74	0·85
Pioneer White Dent	O. Will	Milk	3·69	0·81
Northwestern Dent	Experimental Farm, Brandon	Late milk	4·10	0·80
Northwestern Dent	Northrupp King	Milk	4·42	0·78
Square Deal	O. Will	Dough	3·02	0·77
Northwestern Dent	Steele Briggs	Dough	3·64	0·75
Quebec No. 28	Macdonald College	Early milk	3·66	0·74
Twitchell's Pride	Ottawa	Late milk	3·55	0·71
Manitoba Amber	Manitoba Agric. College	Late dough	3·00	0·71
Manalta	Manitoba Agric. College	Glazed	2·39	0·67

SUNFLOWERS

Although the Mammoth Russian sunflowers do not attain the same degree of maturity as some other sorts, the yield of dry matter is greater than from any other tested. The sunflower crop regardless of variety used is the most dependable and highest yielding ensilage crop grown on this Station.

ANNUAL FODDER CROPS

SUNFLOWERS—TEST OF VARIETIES OR STRAINS

Variety	1929			Seven-year average	
	Height at harvest	Green weight	Dry weight	Green weight	Dry weight
	in.	tons	tons	tons	tons
Manteca	52	14·90	2·64	12·45	1·93
Manchurian	56	12·12	2·62	13·35	2·36
Russian Giant	58	12·09	2·54	14·04	2·50
Black	46	12·23	2·46	12·47	2·09
Ottawa 76	52	12·35	2·11	12·55	2·08
Mammoth Russian	57	9·66	2·09	12·81	2·88
Mixed	48	12·04	2·09	11·94	1·82
Mennonite	37	7·00	1·54	10·06	1·79

ANNUAL FODDER CROPS—TESTS OF VARIETIES AND MIXTURES

1/50-acre plots triplicated—sown on fallow

Crop	Height	Stand	Date cut	Yield per acre cured weight, 12 per cent moisture
	in.			tons
Feeder barley	30	Thick	July 20	1·75
Banner oats and Feeder barley	30	Thick	July 20	1·62
Common spring rye, Banner oats and Feeder barley	26	Thick	July 20	1·51
Feeder barley and peas	24	Normal	July 20	1·43
Spring rye and peas	24	Normal	July 20	1·42
Common spring rye	37	Thin	July 20	1·37
Golden Vine peas	18	Normal	July 29	1·36
Banner oats	21	Normal	July 20	1·28
Mackay peas	18	Thin	July 29	1·28
Spring rye and Banner oats	30	Normal	July 20	1·21
Banner oats and peas	19	Normal	July 20	1·19
Common millet	12	Normal	Aug. 4	0·96
Siberian millet	14	Normal	Aug. 4	0·91
Hungarian millet	12	Normal	Aug. 4	0·78

ALFALFA

On the whole the Grimm has been the most hardy and most satisfactory variety of alfalfa tested. It will be observed that yields have fluctuated widely from year to year depending on the rainfall. The greatest defect of alfalfa as a forage crop in this area is that without irrigation it produces very low yields in dry years.

ALFALFA—TEST OF VARIETIES

Comparative yields for a number of years—sown alone on fallow

Variety	Yield per acre cured hay, 12 per cent moisture content									
	First-year crop						Second-year crop			
	1924	1925	1926	1927	1928	1929	1925	1926	1927	1929
	tons	tons	tons	tons	tons	tons	tons	tons	tons	tons
Grimm (Brooks)	0·89	0·45	1·06	1·56	0·76	0·65	0·70	0·53	1·80	0·63
Grimm (Lyman)	1·00	0·59	1·27	1·62	0·60	*	0·57	0·32	2·17	0·46
Ladak	*	*	*	*	0·69	0·65	*	*	*	0·51
Liscomb	*	*	*	*	0·62	0·64	*	*	*	0·48
Cossack	1·69	0·46	0·95	1·72	0·45	0·57	0·97	T.W.	1·65	0·38
Baltic	*	0·50	0·63	1·70	0·58	0·53	*	0·37	1·49	0·28
Variegated	0·61	0·20	W.K.	1·51	0·43	0·52	0·65	W.K.	W.K.	0·40
M. falcato	2·57	*	*	1·56	0·43	0·49	1·52	*	W.K.	0·36

*Not grown. T.W.—Thin and weedy. W.K.—Winter killed.

SWEET CLOVER

Fair yields of all varieties have been obtained but it should be noted that these were seeded alone on fallow land. This was done to insure a stand which would make comparison of varieties possible.

SWEET CLOVER—TEST OF VARIETIES

1/100-acre plots triplicated—sown alone on fallow

Variety	Height at harvest	Yield per acre cured hay 12 per cent moisture	
		1929	5-year average
	in.	tons	tons
Zouave	22	1·20	1·55
Grundy	26	1·13	1·71*
Yellow	21	1·04	1·32
Common White	27	1·02	1·44
Dwarf	17	0·87	1·65
Maccor	24	0·84	1·33
Arctic	22	0·78	1·44

*Four-year average.

WESTERN RYE GRASS

The testing of western rye grass strains has been started at this Station to assist the Agrostology Division in isolating the most productive of a large number of strains which were selected at one of the other Stations. No conclusions can be based on the work of this Station as yet, but satisfactory progress is being made toward the objective of getting well adapted pure varieties of rye grass for hay and pasture production.

WESTERN RYE—TEST OF STRAINS

Sown alone on fallow—1/100-acre plots—quadruplicated

Strain	Yield per acre cured hay 12 per cent moisture	
	First year	Second year
	tons	tons
Commercial (Check)	0·99	0·49
Ottawa 7	1·08	0·68
Ottawa 10	0·86	0·49
Ottawa 14	0·94	0·57
Commercial (Check)	0·81	0·47
Ottawa 51	0·75	0·56
Ottawa 65	0·88	0·42
Ottawa 78	1·02	0·43
Commercial (Check)	1·13	0·52
Ottawa 96	1·05	0·49
Ottawa 99	1·15	0·45
Ottawa 124	1·30	0·66

YIELDS OF VARIOUS GRASSES, LEGUMES AND MIXTURES WITH A NURSE CROP OF WHEAT

YIELDS OF FIRST AND SECOND YEAR HAY CROPS

1/50-acre plots

Hay crop	Yield per acre cured hay, 12 per cent moisture content			
	First year hay crop		Second year hay crop	
	1929	Seven-year average	1929	Six-year average
	tons	tons	tons	tons
1. Brome and western rye (check)	Failed	0·93	0·45	1·06
2. Brome grass	"	0·90	0·29	1·06
3. Western rye grass	"	1·10	0·41	1·16
4. Timothy	"	0·57	0·20	0·65
5. Brome and western rye (check)	"	0·87	0·30	1·01
6. Kentucky blue grass	"	0·36	0·14	0·39
7. Western rye and sweet clover	"	1·02	0·35	1·01
8. Brome and sweet clover	"	0·93	0·21	0·83
9. Brome and western rye (check)	"	1·12	0·41	1·09
10. Western rye and alfalfa	"	0·96	0·36	1·03
11. Grimm alfalfa	"	1·01	0·13	0·55
12. Variegated alfalfa	"	0·94	0·18	0·55
13. Brome and western rye (check)	"	0·90	0·22	0·89
14. Red clover	"	0·18	Failed	Failed
15. Yellow sweet clover	"	1·01	.....	.....
16. White sweet clover	"	0·98	.....	.....
17. Brome and western rye (check)	"	0·89	0·88	0·88

From the above table it will be seen that all grasses and legumes in this experiment failed to produce a crop in 1929. This failure was due partly to the extremely dry seeding season of 1928 causing a poor stand, and partly to the late summer and autumn drought in the same year. Practically no stand was left at the beginning of winter in 1928.

Very few conclusions as to the relative productivity of the various crops and mixtures can be drawn from these data. The mixtures have been somewhat more sure to produce stands than the individual crops and have produced slightly higher yields of at least as good quality hay.

GRASSES AND LEGUMES WITH NURSE CROPS

This season's failure of grasses and clovers with all nurse crops excepting spring rye indicates the risk involved in seeding down to hay with a grain crop. The failure of these seedings was due largely to the prolonged drought in the late summer and autumn of the year in which seeding was done. Spring rye produced a thin stand, thus leaving more moisture to support the young seedlings of grasses and legumes.

GRASSES AND LEGUMES SOWN WITH VARIOUS NURSE CROPS

1/100-acre plots triplicated

—	Yield per acre			
	1928		1929	
	Brome, western rye, alfalfa	Sweet clover	Brome, western rye, alfalfa	Sweet clover
	tons	tons	tons	tons
Nurse crop—				
Wheat	0·66	1·52	Failed	Failed
Barley	0·68	1·17	"	"
Flax	0·75	1·47	"	"
Spring rye	0·75	1·62	0·41	0·87
Sown alone	1·01	1·82	0·34	0·92

MISCELLANEOUS GRASSES

Test of Miscellaneous Grasses—First Year Crop (1929)

Sown without nurse crop on fallow

Variety	Height	Density of crop	Weeds	Yield per acre cured hay, 12 per cent moisture
	in.			tons
Western rye (commercial)	30	Thick	Nil	1·33
Crested wheat grass (Sask.)	26	Thick	Nil	1·33
Brome (commercial)	32	Thick	Nil	1·30
Western rye (Grazier)	27	Thick	Nil	1·25
Crested wheat grass (N.D.)	26	Normal	Nil	1·09
Crested wheat grass (Clarke)	21	Normal	Nil	1·02
Meadow fescue	21	Thin	Few	0·52
Poa crocata	13	Normal	Few	0·47
Canada blue grass	15	Thin	Bad	0·40
Nodding brome	18	Thin	Bad	0·36
Timothy (commercial)	13	Thin	Few	0·33
Orchard grass	18	Thin	Few	0·23
Kentucky blue grass	10	Normal	Few	0·23
Red top	12	Thin	Bad	0·13

Test of Miscellaneous Grasses

Sown without nurse crop on fallow

Variety	Yield per acre cured hay, 12 per cent moisture	
	First-year crop 1928	Second-year crop 1929
	tons	tons
Crested wheat grass	1·82	0·84
Timothy (Huron)	0·36	0·61
Brome	1·96	0·61
Brome (commercial)	1·21	0·60
Timothy (Boon)	0·27	0·48
Western rye (commercial)	1·05	0·46
Western rye (Grazier)	1·19	0·45
Brome	1·80	0·44
Timothy (commercial)	0·28	0·44
Tall oat grass	.....	0·44

In this experiment new sorts have been introduced from time to time, hence no averages can be given here. Of the older grasses under test Brome and western rye are the only ones that are at all well suited to conditions here. Crested wheat grass, recently introduced, seems very promising for both a hay and pastured crop.

POULTRY

The Barred Rock flock has been increased in numbers and somewhat improved in quality.

At the beginning of 1929 there were 296 laying hens and pullets in the flock. Early in the year another incubator was purchased, making a total of four with a combined capacity of 1,200 eggs. All incubators are not set at once because of the need for extra space to separate chicks for pedigree work.

Begining on March 20, a total of 2,940 eggs were set, from which 1,965 chicks were hatched. Of these 1,000 were kept on the Station and 965 sold as day-old chicks. Of the 1,000 kept on the Station 956 survived at the time of leg banding. As soon as cockerels could be distinguished from pullets, at about six weeks of age, 400 cockerels were put in separate runs and accurate records of feed consumed and returns obtained from the sale of these birds were kept.

The 400 cockerels weighed 585 pounds and were valued at $160. They consumed a total of 6,201 pounds of feed valued at $107.26. The returns consisted of 1,186 pounds of poultry at thirty cents and 475 pounds at twenty-five cents, making a total of $474.55. The value of the young cockerels added to the value of the feed consumed totals $267.26. That amount deducted from the return value leaves a margin over cost of cockerels and feed of $207.29, or more than 50 cents per bird. This margin is, of course, largely dependent upon the selling price. While the above figures represent the prices at which the product was actually sold, it seems improbable that such prices could be obtained consistently for a large volume of product. However, an average selling price of 25 cents per pound would show a fair profit on the project.

This season seventy cockerels were considered fit to be kept for breeding purposes. Twenty of these will be required in the Station flock and the balance will be sold to farmers.

One hundred and seventy-five of the best pullets have gone into the laying pens, eighty-four have been sold to farmers and the balance disposed of for meat.

Among the 1928 pullets were some fairly good producers, both with respect to number and size of eggs. The following list shows the production of the best twelve birds:—

PRODUCTION OF PULLETS 1928-1929

Pullet	Number of eggs	Weight per dozen
		ounces
M. 5	261	24
M. 14	201	24
M. 23	200	24
M. 25	213	24
M. 37	215	24
M. 48	200	24
M. 55	212	25
M. 65	308	24
M. 77	216	23
M. 96	218	25
M. 103	200	25
M. 106	210	23

OTTAWA: Printed by F. A. ACLAND, Printer to the King's Most Excellent Majesty, 1930.